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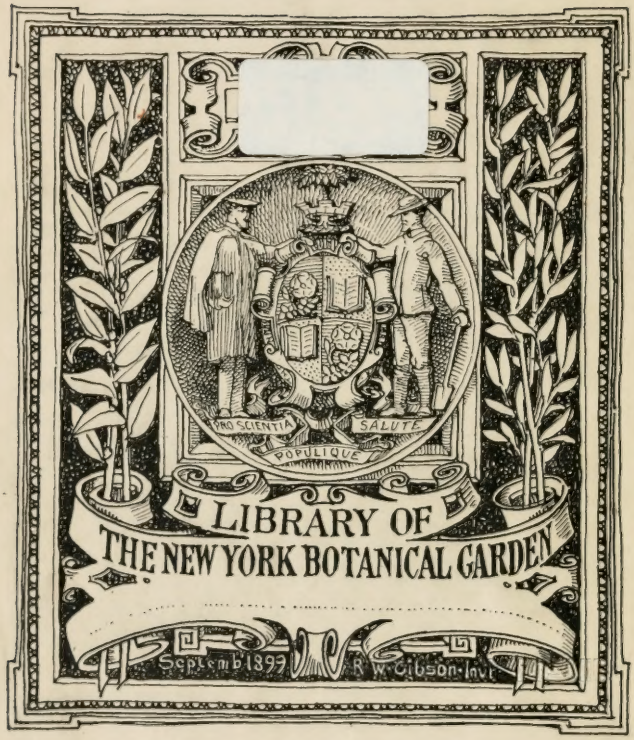
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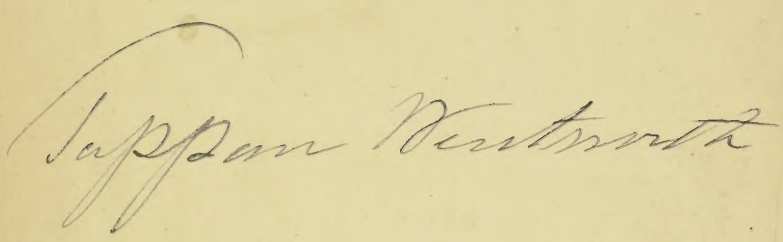

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Board of Agriculture.

SECRETARY'S REPORT,

WITH AN

ABSTRACT OF RETURNS

OF

AGRICULTURAL SOCIETIES.

JERSEY BULL COLONEL.

Property of Mass. Society for Pro. of Agriculture

FIRST ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE,

TOGETHER WITH

THE REPORTS OF COMMITTEES,

APPOINTED TO VISIT THE COUNTY SOCIETIES.

WITH AN APPENDIX,

CONTAINING AN ABSTRACT OF THE

FINANCES OF THE COUNTY SOCIETIES.

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BOARD OF AGRICULTURE, 1854.

EX OFFICIIS.

His Excellency EMORY WASHBURN.
His Honor WILLIAM C. PLUNKETT.
EPHRAIM M. WRIGHT, *Secretary of State.*

APPOINTED BY THE GOVERNOR AND COUNCIL.

MARSHALL P. WILDER, *of Dorchester.*
NATHANIEL WOOD, *of Fitchburg.*
EDWARD HITCHCOCK, *of Amherst.*

CHOSEN BY THE SOCIETIES.

Massachusetts, ...	ROBERT C. WINTHROP, *of Boston.*
Essex, ...	MOSES NEWELL, *of West Newbury.*
Middlesex, ...	SIMON BROWN, *of Concord.*
Worcester, ...	JOHN BROOKS, *of Princeton.*
Worcester West, . . .	
Worcester North, . .	IVERS PHILLIPS, *of Fitchburg.*
Hampshire, Franklin and Hampden, . .	JOSEPH SMITH, *of Hadley.*
Hampshire, ...	JOHN A. NASH, *of Amherst.*
Hampden, ...	FRANCIS BREWER, *of Springfield.*
Franklin, ...	HENRY W. CLAPP, *of Greenfield.*
Berkshire, ...	STEPHEN REED, *of Pittsfield.*
Housatonic, ...	JOSHUA R. LAWTON, *of Gt. Barrington.*
Norfolk, ...	BENJAMIN V. FRENCH, *of Braintree.*
Plymouth, ...	SETH SPRAGUE, *of Duxbury.*
Bristol, ...	J. H. W. PAGE, *of New Bedford.*
Barnstable, ...	C. B. H. FESSENDEN, *of Sandwich.*

CHARLES L. FLINT, *Secretary.*

FIRST ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Massachusetts:

I propose, in my first Report, to review the past and present condition of the Agriculture of Massachusetts. The past will be found, it is thought, full of interest and instruction; the present, full of encouragement and hope. The discussion of special subjects will be left to a future occasion, with the exception of such suggestions as seem to spring naturally from the facts stated. This seems, indeed, to be the only course which can be pursued. Previous to the organization of the present Board, there has been no permanent department or public officer, whose special duty it was to collect the facts necessary for the guidance of the Legislature, and the various societies in their efforts to advance the cause of Agriculture among us. The principal object of the Board, during the past year, has accordingly been to procure the desired information. It is these doings, which I now have the honor to report for your consideration.

We cannot, without some little reflection, make full allowance for the difficulties which surrounded the early settlers of

New England. We must remember that they exchanged a country far advanced in civilization,—and notwithstanding its rude tillage and its large tracts of uninclosed moors, probably better cultivated than any other on the globe,—for one entirely new to them, with a climate and soil unlike any which they had known before. They were to begin a life in which their previous experience could afford them little or no aid, in a wilderness which was to be subdued by their own hands in the midst of a thousand obstacles. The system of cultivation which they had learned and practised in their own land, would not serve them here. They were to start anew, and acquire, painfully and laboriously, the knowledge which was applicable to their new situation. If we find their progress to be slow, let us not wonder that it was so; we should rather wonder that they advanced at all, or even that they did not perish in the wilderness amid the privations and the sufferings of winter.

For many months after their arrival, they had no beasts of burden; when at last a few cows were brought over from the mother country,* they were poorly fed on coarse meadow hay, and often died from exposure and want of suitable food, or fell a prey to the wolves and the Indians. Owing to the difficulties and expense of importation, the price was so high as to put them beyond the reach of many, even in moderate circumstances. A red calf soon came to be cheaper than a black one, on account of the greater probability of its being mistaken for a deer and killed by the wolves. When cows were so high as to sell in 1636, at from twenty-five to thirty pounds sterling, and oxen at forty pounds a pair, a quart of new milk could be bought for a penny, and four eggs at the same price.

It should be borne in mind, also, that the cattle of that ime, even in England, were not to be compared with the beautiful animals now seen there. The ox of that day was small, ill-shaped, and in every way inferior to the ox of the

* The first cattle were imported by Edward Winslow, in the ship *Charity*, March, 1624. Having been sent out as agent by the Plymouth Colony, he brought over four animals, three of which were heifers. One authority says they arrived in the ship *Ann*, the first voyage of which was made in 1623; but there can be no doubt that the cattle referred to, at the time of the distribution of cattle in 1627, came in a subsequent voyage made by that vessel.

present time. The sheep has, since then, been improved to an equal, or even greater extent, both in form and size, and the fineness and value of its wool. The draught horse, so serviceable on the farm, long the pride of London, and now equally of Boston, and the noble breed of race horses, so celebrated for their fleetness, were not then known. It is difficult to appreciate fully the changes, which the increased attention to agriculture has effected in domestic animals, even within the last century.

During the early part of the last century, the average gross weight of the neat cattle brought for sale to the Smithfield market, was not over three hundred and seventy pounds, and that of sheep, twenty-eight pounds. The average weight of the former, is now over eight hundred pounds, and of the latter, over eighty pounds. On account of the high price of cattle at that period, and the risks to which they were to be exposed, it is not probable that the settlers purchased even the best specimens of the animals then known in England. Such being the state of things, we may easily imagine that the first cattle imported into New England, were of a very inferior quality.

Nor was the difficulty of procuring agricultural implements the least of the obstacles which the early settlers had to encounter. Some were imported from the mother country, but all could not obtain them in this way. The only metal to be had was made of bog ore, very brittle, and liable to break and put a stop to a day's work. The implements of agriculture seem, for the most part, to have been made from this metal, and with comparatively little fitness for the purpose for which they were designed. Even those imported from the mother country, were not only of the rudest construction, but were also extremely heavy and unwieldy; for the men of that time had not discovered the art of diminishing weight without lessening strength. The process of casting steel was not invented till more than a century later, (1750,) and then it was kept a secret in Sheffield for some years. The number and variety of implements have been infinitely increased, even within the last half century, to meet the wants of a more advanced husbandry,

to which, indeed, these mechanical improvements have, in their turn, largely contributed.*

It is true that the Pilgrims, on their arrival in this country, had the benefit of the plants at that time cultivated and used as food by the Indians, yet they were wholly unaccustomed to these, and were ignorant of the mode of using them as food, and of the manner of their cultivation. Indian corn, the staple product, and the pride of America, had never been seen by them. Pumpkins, squashes, potatoes and tobacco, were almost equally strange to them. †

When their necessities taught them the value of these plants, they were not slow in adopting the Indian methods of cultivating them. As the general cultivation, in the colonies, continued much the same for many years, with only slight modifications on the introduction of the plough, it may not be inappropriate to turn our attention, for a moment, to the agriculture of the natives.

It is well known, that most of the hard work necessary to supply their limited wants, fell to the lot of the women, assisted, sometimes, by old men and little boys. Among their thankless tasks was that of farming, which they carried on to an extent quite remarkable, when we consider the rudeness of the tools with which they worked, and the circumstances in which they were placed. They had no art of manufacturing metal, and of course could have no proper implements of agriculture. Their cultivation was not so rude, however, as one would naturally suppose. They made a kind of hoe by tying the shoulder blade of a moose, bear or deer, to a stick or pole.

* The colonists do not seem to have been provided with ploughs; for we find that twelve years after the landing at Plymouth, the farmers about Boston, having no ploughs, were obliged to break up the bushes with their hands and hoes, to prepare their lands for cultivation; and even so late as 1637, there were but thirty-seven ploughs in the whole State. It was the custom, even to a much later period, for one owning a plough, to do most of the ploughing in a town; going about from one part of the town to another. The town often paid a bounty to one who would buy and keep a plough in repair, to do work in this way.

† The potato was so rare in England at the beginning of the 17th century, as to be served up only in very small quantities. It was sold at two shillings a pound, for the queen's table, and was used as a fruit, baked into pies, seasoned with spices and wine, and sometimes eaten with sugar.

The land, when selected, was cleared, by keeping up a fire around the foot of each tree till its bark was so burned that it would die. They then planted their corn. When a tree fell, it was burned into pieces of such a length that they could be rolled into a heap and burned to ashes. In this way, by degrees, a piece covered with wood, was wholly cleared. An industrious woman could burn off as many dry fallen logs in a day, as a strong man could, at that time, cut with an axe in two or three. They used a stone axe, made much in the same way as the hoe above described, to scrape the charred surface of the logs, and hasten the burning. This mode of clearing was common through the western part of the State. In the eastern part, the tree was sometimes girdled with the axe, and thus killed, was allowed to dry, and then burned by kindling a fire around it, as above described.

They taught the settlers to select the finest ears of corn for seed, to plant it at the proper time, and in a proper manner, to weed it, and to hill it. They were accustomed to dig small holes four feet apart, with a clumsy instrument, resembling the one described, which, in the eastern part of the State, was sometimes made of large clam-shells. Those living in the vicinity of the sea-shore, put into each hole a horse-shoe crab or two, upon which they dropped four, and sometimes six kernels of corn, and covered it with the implement with which they had dug the hole. In the interior, a few small fishes in each hill, were used as a fertilizer. Beans were planted with the corn after it had come up, and grew up supported by it. Great attention was paid by them to the protection of their growing crops. Not a weed was to be seen in their fields, and the corn was carefully guarded against destruction by insects and birds. To prevent loss by the latter, a small watch-house was erected in the midst of a field of corn, in which one of the family, often the oldest child, slept, and early in the morning rose to watch the blackbirds. It was their universal custom to hill the corn about two feet high, for its support, and spots may often be seen at the present day, which were evidently cultivated by them. The colonists very generally imitated this custom, and it has been continued down to our own times. The men planted and cured their tobacco, which was, ordinarily,

the only plant they worked upon, the women managing all the rest.

This very brief sketch of the agriculture of the Indians would not be complete, without an allusion to their mode of storing their winter supply. Large holes were dug in the earth, and the sides carefully lined with bark. This was also the work of the women. The corn and the beans, after being dried in the sun, or on racks or flakes over a fire, were thrown into these holes, and then covered up level with the surface of the ground. They were thus preserved, if necessary, through the winter. These excavated barns were carefully concealed, by the women, from their lazy husbands and sons, lest they should discover and eat up all; yet, with all the care they could take, the hogs of the colonists often unhinged their barn-doors, and helped themselves to the golden treasure. History says, that one of these Indian barns was discovered by the Pilgrims, at a time when their store of grain was so reduced as to contain but five kernels of corn to each individual.

In addition to this provision for winter, they sometimes made large boxes of wicker-work, or bags or sacks of hemp, which were filled and kept in the wigwam, for the more immediate wants of the family. Grass they had no occasion to cut, though it grew in great abundance along the marshes and the rivers, and in places which had been cleared for cultivation. It was of a coarse quality, yet it made the only hay used by the colonists for some time after the settlement.

To the rude implements used by the Indians, the colonists added the plough. We may well imagine the surprise of the natives at the first sight of a plough. They could not understand so complicated a machine. They wanted to see it work, and when it tore up more ground in a day than they, with their clam-shells, could scrape up in a month, and they saw the colter and the share to be of iron, they told the ploughman if he was not the devil himself, he was very much like him.

The first sight of a ship, it will be remembered, had excited their wonder even to a greater extent. To them it was a floating island; its masts were nothing but trees; its sails were clouds; its discharge of guns was thunder and lightning;

but, as soon as the thunder and lightning ceased, they pushed off their canoes to go and pick strawberries on the island!

After this cursory survey of the method of cultivating the earth, in practice among the Pilgrims and their Indian neighbors, we are better prepared to trace the progress of agriculture down to the present day. It was, at first, the only pursuit of the settlers, and long continued to be their chief occupation.

We have seen that poor and miserable cattle, poor and miserable implements—yet both as good, perhaps, as the time and their means afforded—and poor and miserable ideas of farming, characterized the agriculture of the first English settlers. Nothing was done which was not forced upon them by the pressure of necessity. Their wants were so many, that it required their most vigorous exertions to provide what was indispensable, and they had no time to seek out new principles of agricultural science or improvements in practical agriculture.

The first few years were spent in extending the settlement, exploring the country, and seeking for new and better lands. In the space of thirty years, no less than forty small towns were incorporated, of which Springfield was the most western. An attentive observer is struck by the restless disposition to move from place to place, even in the early days of the settlement. Land new and rich in mould, the accumulation of ages, did not require very careful cultivation, to secure an abundant return. But a few years of constant cropping exhausted its productiveness. The proprietor could easily obtain other lands, to be subjected to the same process. He raised wheat until the land became too poor, and then he raised corn; and when it would no longer produce corn, he sowed barley or rye, and so on to beans.

The number of intelligent cultivators was few, and for the most part agriculture was in a state of extreme depression. This state of things continued with little change, down to the period of the Revolution. That it was so, will not appear strange, when we consider that even in England, where land was high, comparatively, and the demands for produce much greater than here, there was, during the same period, none of

the interest and enterprise which have since changed the whole face of the kingdom.

It should be mentioned, however, that in 1747, the Rev. Jared Eliot, of Connecticut, began the publication of a series of essays on farming, full of valuable suggestions, and marked throughout, by a degree of intelligence and good sense far in advance of his time. His experiments in draining, and in the improvement of salt marsh, are among the earliest attempts at real progress in the country.

But with very few exceptions, there was no spirit of inquiry to give a charm to agricultural labor, and it was performed by the farmer as an evil which must be endured, from stern necessity. Having no love for his occupation, he paid no attention to the selection of the best stock, and the best seeds. Owing to the imperfect provision for schools for the great body of the people, the boy was trained up to a narrow routine of labor, as his fathers had been for a century before. He often affected to despise all intelligent cultivation of the soil, and not only scrupulously followed the example of his fathers, but also advised others to do the same; thus transmitting to us in the line of succession, the very practices which had originally been derived from the uncivilized Indian.

The manner of settling new lands being such as has already been described, it will be seen that the population must have been scattered over a large extent of territory by the middle of the last century. Ten counties had been incorporated, and one hundred and forty towns. The proportion of the population collected in the great centres at that time, was comparatively small. Boston contained less than fifteen thousand inhabitants, and next to that stood Marblehead; but it might almost be said, that in neither of these did the houses quite shut out the woods and the fields; for in the former,—by far the largest town in the State,—the space now occupied by the Common and the western slope of Beacon Hill, including all the western part of the city, was used as a pasture for cattle. The spots where some of our most flourishing towns and villages now stand, were then covered with a dense forest.

Few of the rural population of that day saw a newspaper or a journal of any kind. At the commencement of the last cen-

tury there was not one published in the State, and in 1750 there were but four. The circulation of these was confined, for the most part, to the metropolis; a few copies being sent to clergymen in the country. There were but six in 1770, and one of these was discontinued in June of that year, for want of support. The facilities of travel were so limited that few of the farmers ever went beyond the borders of their own towns, unless it were to market. It will be seen, therefore, that there was no opportunity of cultivating those larger and more generous sentiments which now mark the progress of civilization, and the spread of knowledge and intelligence among the people. Obstinate adherence to prejudice of any kind, is now generally regarded as a mark of ignorance or stupidity. A century ago, the reverse was the case. In many a small country town, a greater degree of intelligence than was possessed by his neighbors, brought down upon the farmer the ridicule of the whole community. If he ventured to make experiments, to strike out new paths of practice, and adopt new modes of culture; or if he did not plant just as many acres of corn as his fathers did, and that too in "the old of the moon;" if he did not sow just as much rye to the acre, use the same number of oxen to plough, and get in his crops on the same day, or hoe as many times as his father and grandfather did; if, in fine, he did not wear the same homespun dress, and adopt the same religious views and prejudices, he was shunned in company by the old and young, and looked upon as a mere visionary. He knew nothing of a rotation of crops. With fireplaces adapted to make the largest quantity of ashes, he had no idea of their use, and would have sold them for the smallest pittance in money. The use and value of manures was little regarded. Even so late as within the memory of men still living, the barn was sometimes moved away to get it out of the way of heaps of manure, by which it was surrounded, because the owner would not go to the expense of removing these accumulations, and put them upon his fields.

The swine were generally allowed to run at large, the cattle were seldom housed or enclosed at night, during the summer months, the potato patch often came up to the very door, and the litter of the yard seldom left much to admire in the looks

of the barn or the house. Men who suffered their cattle to run loose in the summer nights, thought it necessary to let them run at large very late in the fall, and to stand out exposed to the severest colds of winter "to toughen." Orchards had been planted in many parts of the State, but the fruit was mostly of an inferior quality, and used mainly for the purpose of making cider.

In the latter part of the last century many left the seaboard and removed to the interior, to avoid the inconveniences arising from the difficulties between this country and Great Britain, and other causes. More attention seems, then, to have been paid to agriculture. The population had now become scattered over the whole State, and the whole territory had, in 1790, been incorporated into towns or districts. Men had begun to emigrate to the so-called inexhaustible West; which at that time, meant Central or Western New York.

A few public spirited and patriotic men now began to see the necessity of some such associated effort as should excite the public mind to such action as would lead to the development of the industrial resources of the State.

Up to this time, no journal devoted to agriculture had been published in America, nor, indeed, to my knowledge, in England. In the latter country, however, public interest had been aroused, to some extent, by the success of Bakewell, in breeding stock, and by the writings of Young and Sir John Sinclair, under whose auspices the Board of Agriculture was established, in 1793. The Dublin Society had been instituted as early as 1749, and though it had but little influence at first, it had contributed largely to the prosperity of that part of the kingdom, by directing attention to this field of investigation. The Highland Society of Scotland was formed in 1784, and incorporated in 1787. These facts are mentioned to show that this most important interest began to assert its claims nearly at the same time in Great Britain and America.

The Massachusetts Society for the Promotion of Agriculture was established in 1792. It was followed by a similar society in New York, incorporated the next year, 1793, having been first formed in 1791. The Philadelphia Society had been established in 1785. These societies were managed by men

of the most devoted zeal, but, owing, perhaps, to the state of the times, to the fact that there was little or no disposition in the community to examine the subject, or to a defective organization, they failed to excite any spirit of emulation in the public mind. Not many years after their establishment, they began to publish a small volume annually, for circulation among the members. Of these volumes, those published by the Massachusetts Society are deserving of special mention, as containing many useful hints and valuable suggestions. A list of premiums was also offered. An exhibition was held at Brighton, by the Massachusetts Society, and a ploughing match instituted, not so much with the object of improving the plough, as of trying the strength and docility of the oxen. The plough-maker, it is true, happened to be there, and saw the defects of it, and since that day an amount of scientific knowledge has been brought to bear upon this implement sufficient to bring it very near perfection. *

The Kennebeck Agricultural Society was instituted at Augusta in 1800, and incorporated in 1801. This was the second society incorporated in Massachusetts, it being at that time within the limits of this State. A voluntary Association of the Middlesex Husbandmen, was formed in 1794, and incorporated in 1803, under the name of the Western Society

* The plough, at that time, was nearly the same as that which had been used a century before. Its form and size showed but little ingenuity, and gave evidence only of a sufficient supply of timber. According to the ideas of farming then prevalent, it answered the purposes very well, however. It was generally thought that manure ploughed in, could not be kept too near the surface. They supposed it was dissolved by the rains and carried down beyond the reach of the roots of plants. While such opinions were entertained, there was, of course, no inclination to subsoil, or plough deep. Either would have subjected the experimenter to ridicule, for his waste of muscle and manure. This theory of ploughing prevailed very extensively; indeed, so tenacious are the prejudices of men, that it is not yet wholly abandoned, though long since given up by all intelligent farmers. As a further evidence of the limited information of farmers, at a comparatively recent period, we may refer to the fact that it is not more than forty years since many of them made it a rule to sow turnip, and other seed, only in the "old of the moon;" and it was not till Arago had clearly demonstrated that the light of the moon had no influence on vegetation, that this idea was wholly abandoned, even by scientific men. It was believed, too, that the fertilizing power of gypsum was limited by geographical lines, varying, not according to differences in soil, but according to distance from the sea.

of Middlesex Husbandmen. This name was subsequently changed by the legislature, to the Society of Middlesex Husbandmen and Manufacturers.

The Berkshire Society was incorporated in 1811, having been suggested by the exhibition of three merino sheep, in 1810, under the great elm tree still standing in the public square of Pittsfield. The projector of this Society encountered the opposition and ridicule of all classes of society, from the moment the proposition was made. It was at first viewed by many, even with contempt. Gradually, however, the feelings of the people were enlisted in its favor, premiums were offered and awarded, and a large concourse from all parts of the county, increasing rapidly from year to year, showed clearly that something had reached the heart of the community. The Essex, the Worcester, and the Hampshire Franklin and Hampden Societies, were incorporated in 1818, and the Plymouth in 1819.

It may be remarked that all the County Societies, previous to 1820, suffered much from the unjust criticism and ridicule of the class they were intended to benefit. Thanks to the intelligence which our common schools have so widely diffused, farmers are now among the first to appreciate every well meant effort. Under the auspices of the government, which came to the aid of these societies in 1819, so great an impetus has been given to the improvement of our agriculture, that the entire aspect of the State has been changed since then.

The period of thirty years, succeeding 1790, deserves a passing remark. In it occurred the second war with England, which produced a general stagnation of business. The unprecedented successes in the East India trade, had created an unnatural excitement in many parts of the State. Tales of hitherto unheard of fortune, tempted the young to forsake the country, the plough and the homespun dress, and to look with contempt upon the occupation of their fathers. Farming, indeed, had never been made attractive to them. Their fathers had always been half ashamed of it, and they could hardly be expected to feel any regard for it. It had few claims when compared with the occupations whose magnificent results their excited imagination was continually picturing to

them. The retailer of tape and teas, the drawer of liquor behind the counter, the shoer of horses, had always had in their mind, a rank above the laborer on the farm, and it was not to be supposed that a position in the counting-room, and the prospect of wealth, would leave them at ease on the acres which had been moistened by the sweat of their fathers. Agriculture, therefore, had fallen into disrepute, and the young and ambitious sought distinction, wealth and power in other occupations. The embargo in 1807, though a serious disaster to many flourishing seaport towns, which were nearly ruined by it, and have never since wholly recovered, was, without doubt, a great advantage to the agricultural interests of the State. Intelligent men began to turn their attention in this direction, and often invested their capital in agricultural operations. These individuals, in many cases, were men who had travelled extensively, and seen the improvements introduced abroad; merchants, disheartened by the uncertainties of commerce, who brought into the country a cultivated taste; sea captains, whose observation and acquaintance abroad had made known new fruits or new breeds of cattle. Some of the vessels taken and brought into our ports, had on board superior animals designed for Canada. They were left, of course, in the vicinity, and to this day, the descendants of Herefords, so taken, may be seen in some parts of eastern Massachusetts. These men, it is true, often spent vast sums of money in building the noble mansions which now adorn many parts of the country, and in farming experiments, in which they not unfrequently failed; but they showed their less affluent neighbors what could be done, and there can be no doubt that they largely contributed to the progress of agriculture. The war, and the failures consequent upon the reaction in the tide of affairs, did still more to put a timely check to the tendencies above alluded to.

The noble efforts of patriotic men, many of whom were connected with the oldest agricultural society in the State, also did much to effect a change in public sentiment. They saw, they could not help seeing, the consequences to which these perverted sentiments would lead. They perceived the evils that must inevitably arise from that morbid refinement which

would cast into contempt an occupation on which all classes depend,—a refinement not less dangerous to the Commonwealth, than it is contemptible in the individual who cherishes it,—and labored zealously to remove it. The change produced in popular feeling by the various causes above referred to, resulted in the increased number, prosperity and influence, of the County Agricultural Societies. The State, too, began, in 1819, to lend some efficient aid to the advancement of its first great industrial pursuit, while the growing demand for raw material for manufacturing purposes, opened a home market—the best of all markets—to the farmers of the State.

The progress of the agriculture of the State for the last thirty years has been more marked. The general diffusion of some degree of scientific knowledge, and the great increase of the number of readers in the community, have undoubtedly contributed largely to it, while the good effects of associated effort are too striking to be overlooked, and are now universally acknowledged. At the commencement of this period, a restless and unsatisfied desire of change was doing much to unsettle the minds of men, in all parts of the State. It tended to prevent all permanent improvements on land, as men feared that they might never be paid for their labor, and felt that their children would not stay at home to reap the benefit of it. This feeling was not by any means difficult to account for. It was the legitimate successor of the short-sighted policy which had led the farmers of an earlier day to work merely to satisfy present necessity, and keep off absolute starvation, without regard to the comforts and hopes of the future. The injurious effects which resulted from these narrow and selfish views, cannot now be estimated. They were completely destructive of that enterprise and desire for improvement in young men, which a different feeling, on the part of those who had gone before them, would have cherished and encouraged. The farmer's sons were, sometimes, even trained up with the idea that the farm was to be sold. They had little inducement to sow where they could never expect to reap. The disastrous season of 1816 had, perhaps, contributed somewhat to discourage the farmer. Evils came in quick succession. Not a month occurred in which there were not frosts. The crops were blighted, and

in many instances, destroyed, by an insect whose ravages were extensive.

The culture of Indian corn fell at once into disrepute, as an uncertain crop, and it was only by slow degrees that it came again to be a favorite of the farmer. Gradually, however, things began to assume a brighter aspect. As an evidence of the progress which has since been made, it is only necessary to allude to the number of acres of waste and unimproved lands, in all parts of the State, which have been reclaimed to fruitfulness and beauty; to the many noble farms whose products have been doubled and trebled; to the comparative freedom from mortgages in the country; and to the evidence, now everywhere seen, of the enterprise, the energy and intelligence of the people. If the rate of progress, indicated by a comparison of the returns of 1840 and of 1850, should continue, it would take but little more than thirty years to bring all our waste lands capable of improvement, under some degree of cultivation. Probably for each year in the future, we may calculate on an advance equal to that of any one former year, on account of the increasing population and wants of the State, and the continually growing interest felt in the subject. The conviction is fast gaining strength, that these lands, many of which are low, wet swamps, will be more profitable than any other in the State. To this marked progress, the agricultural societies have, undoubtedly, largely contributed. The older societies have already been alluded to. The Bristol Society was incorporated in 1823, the Barnstable and the Hampden in 1844, the Housatonic in 1848, the Norfolk in 1849, the Hampshire and the Franklin in 1850, and the Worcester West in 1851.

In 1852, the Board of Agriculture was established, by an Act which provided that "All the duties of the Secretary of the Commonwealth, relating to returns of Agricultural Societies, shall be performed by the Secretary of the Board of Agriculture."

A Secretary was appointed in January, 1853, who entered upon his duties in the course of the February following. Though he had long been familiar with the details of practical farming, the duties of the office were, for the most part, new,

and of a responsible nature. They were sufficient to occupy his whole time in the labors of the office, and, at the same time, he was expected to visit all sections of the State, and become familiar with their wants and necessities. It will be seen that the duties are of a two-fold character, and must, therefore, give rise to much difficulty, till some provision is made for permanent assistance in the work of the office.

When the present Secretary entered on the performance of his duties, the State had, for some years, been paying, in bounties, a sum which had annually increased till it exceeded nine thousand dollars. It seemed to be very important, if this practice was to be continued, to arrange some uniform system of returns, in order that the manner in which all these bounties were appropriated might be understood at a glance. It was impossible to perfect the details of the system the first year. Great care was taken, to prepare such blanks, to be used by the officers of all the societies, as would show the extent of the permanent funds of each, and the mode of investment, the manner in which the income was expended, the comparative amount of premiums paid on each article throughout the State, and the extent of the influence of each society; the last being indicated by the number and names of the towns in which premiums were awarded, and the amount paid to each. These requisitions have been fully and promptly complied with, by the Secretaries of all the Societies in the State, so far as it was in their power, and the result has been very gratifying. Many improvements in the blanks have already suggested themselves, and it is hoped that a complete system of agricultural returns will soon be made, by which the proceedings of each county will be so brought to the knowledge of the citizens of other parts of the State, as to be of interest and instruction to all.

Special care has been taken, to effect a general and judicious distribution of the volume of Agricultural Transactions, annually published by the State. Copies have been sent directly to the small and remote towns, many of which had no representative and no express, to men who read it with interest, and who desire to improve by the practice and experience of others. It has thus been put into the hands of very many

who could not, otherwise, have obtained it without great difficulty.

A correspondence has been opened, and an interchange of publications established, with most of the States which have Societies encouraged by the government. A direct system of exchange has also been established with the Bureau of Agriculture, of France, from which a very valuable collection of books has already been received. Copies of our own publications have been sent in return. The mutual interchange of kind offices between different governments, should be a source of just pride to the citizens of each, and must, necessarily, be an advantage to both.

The importance of obtaining full and accurate agricultural statistics is too obvious to need comment. As yet, no plan has been devised, by which it has been possible to arrive at satisfactory results. To meet this great want, in some measure, the following circular was sent to men of good jugdment in every town in the State; and the returns have been such, that from them, with the aid of the results of much observation throughout the State, and other sources of information, we may obtain a tolerably clear idea of the present condition of the Agriculture of Massachusetts:—

COMMONWEALTH OF MASSACHUSETTS.

Board of Agriculture, Secretary's Office,
Boston, Sept. 1st, 1853.

Dear Sir:—

I desire to obtain from each town in the State, such facts and statistics as will enable me to make an accurate statement of the present condition of our agriculture.

Any aid which you may be able to render me, either of your own knowledge, or by interesting other intelligent and observing men to furnish me with the desired information, will be gratefully acknowledged.

Your attention is more particularly called to the following inquiries, with such other suggestions and observations as may be interesting and useful to your town, and to the friends of agricultural improvement throughout the State:—

1. What are the chief products of your town?

2. The estimated number of acres devoted to each?

3. The average yield per acre of grain and Indian corn?

4. What attention is paid to raising field crops of beets, carrots, ruta-bagas, &c., and what is the average yield per acre, of each?

5. What is the average yield per acre of English hay?

6. The increase per acre, within the last ten or fifteen years, arising from improved cultivation, or from reclaiming meadow and waste lands?

7. The estimated number of acres of reclaimed land?

8. Is there an increasing or decreasing number of acres in tillage?

9. Is there an increasing or decreasing number of acres in pasturage?

10. Is the value of farm land increasing or decreasing?

11. What is the estimated per cent., realized on the value of farms, and the capital invested in the management of the same?

12. The estimated number of acres of woodland, and the average value per acre?

13. The estimated rate of increase or decrease of woodland?

14. What manures are chiefly used, and how applied? What attention is paid to composting, and what is believed to be the most profitable mode of doing it?

15. What per cent. increase of manure might be made on your farms, with reasonable care, and by what means?

16. What degree of attention is paid to the breeding of stock?

17. What breed of milch cows and working oxen is most esteemed?

18. What is the average quantity per day, of milk and of butter from a single animal of each breed of cows?

19. What is the number of full-blooded animals of each breed of horses, cows, sheep, swine, &c.?

20. What are the principal breeds of sheep, and what is their average value per head?

21. What are the breeds of swine most esteemed, and the comparative value of each?

22. Is it supposed that pork can be raised with profit in your town?

23. What is the amount of tobacco raised in your town?

24. What quantity of cranberries is annually gathered?

25. What attention is given to the cultivation of cranberries, and what is the estimated yield per acre of the cultivated and uncultivated?

26. What quantity of broom corn is raised?

27. What attention is given to the cultivation of fruit, and with what result on the increased profits of the farm?

28. The estimated proportion of native and foreign laborers employed on your farms, and what is the average pay to each class per month?

Will you oblige me by answering as fully as possible before the first of November?

Very respectfully, your obedient servant,

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

It is gratifying to say, that the request for information from the various towns, has been very generally complied with; and the answers received from different parts of the State have been of essential service to me.

The great staple products of the State are already well known. The first to which attention is called, is, of course, the noblest of them all—Indian corn. In the numerous letters received in answer to the above circular, there is a singular coincidence of opinion, that farmers in the different sections of the State now cultivate less land, but do it better than formerly, under the impression that good crops from small pieces well tilled, are more profitable than the same crops would be from larger surfaces imperfectly cultivated. This opinion shows, at least, an encouraging change in public sentiment, and might, perhaps, be strikingly corroborated by statistics obtained both officially and by private inquiry.

INDIAN CORN.

It appears from the returns of 1840, that there were 1,775,-074 bushels of Indian corn raised that year in the State; while

in 1850, the number of bushels had risen to 2,295,856, making an increase of 520,782 bushels in the ten years preceding 1850, or an average annual increase of about 52,078 bushels. Unfortunately, the number of acres devoted to this crop were not returned, and we cannot, therefore, arrive at a direct and reliable result. The number of acres of tillage land, during the same ten years, had increased from 259,038 to 300,269, or at the rate of about 4,000 acres annually. But allowance should be made for the increase in the number of actual cultivators, which in some localities has been considerable. From other sources, also, it has been ascertained with tolerable certainty, that the average yield at that time was not greater than from twenty to twenty-five bushels per acre, while the average yield at the present time cannot be less than thirty bushels per acre; and in the judgment of most of those who have expressed an opinion on the subject, it is at least thirty-five bushels per acre. The yield for the last season was greater than usual. It is thought by the best judges, to be at least ten per cent. greater, and many would say twenty per cent. greater than that of 1850. Estimating it, however, at only ten per cent., and we have raised the past season, at least 2,525,441 bushels.

It is the opinion of many, fully capable of judging, that, considering our proximity to the market, and the various other facilities at our command, we can afford to raise corn and put it into the market, cheaper than it can be brought from the West. Much of our land is well adapted to it. Within the last ten years, probably larger crops have been raised than were ever before known in the State. They have, at least, shown what can be done, and the result has been highly beneficial to many sections of the State.

A most intelligent and practical farmer of Plymouth County, speaking of this crop, says:—"Indian corn is easily and profitably raised, where proper attention is given to the cultivation. Less extensive fields are now planted than formerly, but much more corn taken from the acre. The average yield now, is probably about forty bushels to the acre. Many fields are planted, which produce far less. Others, well prepared and cultivated, yield from eighty to more than an hundred

bushels to the acre. Since experiments have been made, and the results laid before the farmers, they have happily become convinced that it is a poverty-smiting business to plant old fields continually without dressing, and many of the poorest fields are now left to grow up into forests."

It may not be improper here to suggest the inquiry, whether, instead of continuing to cultivate many of our old and worn-out lands, particularly the light lands of Bristol, Barnstable, and Plymouth, at a great outlay of labor which they require, it would not be real economy to turn them to woodland, and bring under cultivation new and stronger lands, now covered with wood. Many such exhausted farms of light soil, and almost entirely unproductive, now disfigure the surface of the State; while lands directly adjoining, though in the main of the same character, would bear respectable and remunerative crops with far less labor. The mode by which waste lands of this description are converted into woodland, will be alluded to hereafter.

Indian corn has for some years gradually gained the confidence of the farmers of this State, and has come to be considered as, on the whole, the most reliable and profitable crop that can be raised on our soil.

A practical farmer, of Berkshire, writes as follows:—"Corn is the best grain crop produced by our farmers, and they have become more interested in the cultivation of this crop than any other grain. I should judge that nearly one-half of our soil was a clay loam; on this, we like deep ploughing, from six to twelve inches, according to the depth of the soil before reaching the hard pan. We consider green sward preferable for corn. If coarse manure is to be used, it is thought best to plough it under, particularly on a clay loam soil. After ploughing, the soil should be well pulverized. Fine manure and compost are used in the hill, and broadcast. No doubt the best policy is to spread all manures, that the strength may not be exhausted by the first crop; but it is the practice of many of our best farmers to use fertilizers in the hill. This gives the corn an early start and good nursing in its infancy, and is of great advantage. Wood ashes are well adapted to all kinds of soil; more valuable than they are

generally considered, and highly beneficial to the growth of corn. Plaster is used on our light slate soil to good advantage.

"A compound, which is used by many of our growers of corn to very great advantage, is made up of one-fifth hen manure, one-fifth plaster, and three-fifths ashes, well mixed and left to ferment. A small handful is put in each hill. We plant the eight and twelve-rowed yellow corn, from the 15th to the 25th of May, thirty-six hills to the rod, with four or five stalks in each hill, according to the richness of the land. Most of our farmers hill their corn; but, there is no doubt that working the land level is altogether preferable, on account of droughts, and the danger of disturbing the roots of hilled corn by ploughing. It is reasonable to believe that an even surface of land will receive the dew and rain more evenly than an uneven surface."

This mode of planting corn is more frequently preferred by the best farmers than any other; that is to say, on green sward left in the spring till nearly the time of planting, so as to allow the grass to get started if possible, when long manure is spread on the surface and turned under. It is thought advisable, in all cases, to put a small portion of well decomposed manure in the hill. All plants receive some part of their nourishment from the air after the leaves are well developed. It is important, therefore, that they should be well and early started out of the ground, and have something in the hill to supply them food, till the young roots are sufficiently grown to run out in search of other materials in the soil. The growth of the corn is far more rapid where half or two-thirds of the manure only is spread and ploughed in; the other half, or one-third, put in the hill. It is thought, also, that the land is permanently improved by this method, or much more likely to be, than if all the manure is put in the hill.

Two good illustrations of these different practices came under my observation during the past season, very near to each other, though by different cultivators. One of them, spread a very large and liberal allowance of manure, and ploughed and tilled very thoroughly, with reference to offering the crop for

premium; yet without putting any manure in the hill. The other, put as much on the piece, but used it all in the hill, manuring very richly. Neither obtained much more than a medium crop. There could be little doubt if the plan pursued by each had been slightly modified, the crop of both would have been largely increased.

It is proper to remark, also, that the best farmers in other sections of the State, are fast adopting the flat culture as the most rational and the best; and chiefly, for the reasons stated in the extract above. There is, also, another advantage in it; that grass seed can be sown among the corn, if desired, in August or September. This is sometimes done, and always with success. If the corn is planted in spring with this intention, it is thought best to spread the manure as above described; plough and furrow, using concentrated manure, as guano, in the hill. The corn is dropped upon it, and covered; the top of the hill being in the furrow, below the surface of the ground. The first hoeing raises the earth slightly up around the corn, and the second, makes the surface perfectly level. But few experiments of this kind have come under my observation, but they have been, without exception, very successful; and it is probable that this method of planting will be more generally adopted, particularly on land subject to drought.

Hay.

Another very important crop, and one whose failure or success must have great influence upon the prosperity of the farming community, is that of hay. Scarcely any thing raised in the State is of greater consequence. On it depends largely, or perhaps wholly, our success in the keeping and improvement of stock. The severity of our winters requires us to use the utmost care and foresight to guard against their effects, and hay must always continue to be the article most relied on for fodder for our cattle during the winter.

The necessity of a rotation of crops, is now generally admitted; and many, in their practice, apply with more or less discretion, the principles which late researches on this subject have established. This improvement, together with a better acquaintance with the nature of soils, and the greater

attention paid to the study and preparation of manures, has done a great deal to increase the productiveness of our lands; but there is still room for much further advancement in this direction. What we have done, is little, when compared with what yet remains to be done.

The average yield of upland mowing land throughout the State, was returned, in 1840, at three-fourths of a ton per acre. The whole number of acres of such land, was 440,930. By the returns of 1850, we find this number to have increased to 528,025. The yield, in 1840, was 467,537 tons, while in 1850, it was 483,228; showing a small increase in the yield per acre, making it nine-tenths of a ton. The practice of reclaiming land has become so general, even within the last five years, that it is perfectly safe to assert that the yield is now somewhat greater. The cities and large towns are fast growing in population, and call for a more careful cultivation in their vicinity. Experiments have excited interest and competition. Land is better manured, and holds out better in grass. According to returns made to this department the past season, from men as capable of judging as any, the average yield per acre is $23\frac{1}{5}$ cwt., or about one ton and one-seventh. Making all allowances for a favorable season and over statements, we may set down the present average as not less than one ton per acre.

An intelligent and practical farmer of Hampshire County, speaking of this subject, says:—"For ten or fifteen years past, great improvements have been made in English mowing lands. Such as were considered worthless then, have been so improved as to produce the first quality of English grass, which will yield from two to three tons of hay per acre. I should think that quantity and quality had increased within fifteen years, at least, one-third; some farmers think one-half. Many tons of hay are sold annually at the neighboring manufacturing villages."

Another, writing from Berkshire County, says:—"Hay is a large crop with us. The two years last past, have tried our meadows very severely; the extreme drought of the first, and the almost constant rains of the latter, have so operated, that our average for this year will not at all compare with that of

former years. Our bottom lands, in a good season, can be depended upon for about two tons per acre; but many of them will yield three or four tons. This yield is obtained without any extra care, the deposits from the overflow of the Housatonic, being the chief manure used, with the exception of a little plaster. From the best information I can gather, I should set down the average yield of our whole meadow land to be about one ton and a half per acre."

Another from the same county writes :—"The average yield of English hay, is one ton and a quarter per acre. Probably 25 per cent. increase from improved cultivation, within the last ten or fifteen years. Several swamps have been converted into excellent meadows."

Another in Franklin County says :—"The average yield is one ton and a half to the acre. Some of the best mowing land produces four tons to the acre. The increase in fifteen years is about one-third."

Another practical farmer in Hampshire County, says :—"Considerable attention is paid to reclaiming swamps for mowing, which has greatly increased the amount of hay upon some farms. Within sight of where I am now sitting, there is a tract of land, which, six years ago, bore nothing but brakes and whortleberries, and which, by draining and ploughing, and the addition of but little manure, now produces two loads of good hay to the acre, and has paid its way during the process of reclaiming, which we cannot always expect. There are hundreds of acres in the State, which would do the same."

In Worcester County :—"Average about one ton and a quarter. A gradual increase per acre from year to year, for the last ten or fifteen years. From 1843 to 1853, probably one-eighth, or 12½ per cent. increase."

Another writer in the same county, says :—"With many of our farmers, the average yield per acre would be from thirty to forty hundred. The average, throughout the town, would not be more than twenty hundred if it exceeded fifteen hundred.

"Swamp lands have been greatly improved, within the last five years. They are regarded as the most valuable for grass, and are kept in a productive state, with the least expense. The

mode of improving them is to thoroughly drain, then plough, seed down with a top-dressing of compost, in which is a great preponderance of loam, sand, or even gravel. Then top dress once in three or four years. Herds-grass, redtop and clover, are the seeds used. There are more than three hundred acres of this kind of land improved. Grass has always been taken from this land, but of poor quality."

In Norfolk County, an intelligent and practical farmer writes:—"English hay is extensively cultivated, and considered the most profitable crop raised. As the soil is well adapted to it, and much of the land in a good state of cultivation, the average yield is probably one ton and a half to the acre. Within the last ten or fifteen years, much time and attention have been given to draining and improving meadow and waste land; much of which was almost worthless, but now produces a very valuable crop, and probably the increase is one-half."

Such is the weight of the testimony, in many parts of the State; and what gives credit to it, is the fact, that writers in the same localities, as in adjoining towns, without any concurrence or connection, in many cases, singularly confirm the judgment of each other; in other localities the evidence would lead to a different conclusion as to an increase in the yield.

A distinguished practical farmer, writing from Worcester County, says:—"The average yield, per acre, is one and a half tons. The increase, for the last ten or fifteen years is not much. There has been some improvement in cultivation, but the deterioration of the land has probably kept pace with the improvements, and the hay crop is the same as ten years ago."

In Essex County, one fully competent to judge, says:—"The average yield, per acre, of English hay, varies much with the season. In a good year, about a ton to the acre. In some years not over half that. One or two opinions place it as high as a ton and a quarter in a good year. Perhaps the eight hundred acres may be set down as producing one thousand tons. This is the principal article marketed. It is the object to keep as much land as possible in mowing.

"The increase of hay, by reclaiming meadow lands, has been very considerable in the time of the present generation,—say twenty to thirty years. In this time, it may be estimated at

one-fifth, perhaps; but, confining the question to the time named, it would be but a small proportion of this increase. Probably there is no increase of this article from improved cultivation, nor of other farm products, from this or from either way named."

So in Plymouth County, an eminent writer says:—"The average product of hay is probably about one ton to the acre. On some well-cultivated fields, from two to three tons are taken; but many old fields are mowed where the yield is less than half a ton. English meadows have not been increased in the last fifteen years, and less hay is made now than formerly. This diminution may be accounted for partly, by the increasing mechanical pursuits, and partly by the partial failure of several domestic markets, since the establishment of railroads."

In Bristol County, the evidence is to the same effect. One correspondent says:—"One ton of English hay, per acre, is considered an average yield, though some farms average more than double that, but there are more that produce less. The increase, for the last ten years, has been but a little, though some farmers have doubled their crops, and more than that on an average; others have fallen off."

The reason of this is given, as follows:—"But little attention has been paid to reclaiming land; most farmers think it better to let the swamp and very rough land come into wood. A few have paid some attention to it, and find it pays well; but most farmers say they cannot afford it, labor is so high. I am of the opinion, that not more than two hundred acres have been reclaimed."

In Barnstable County, a writer says:—"The average yield of a single crop of English hay, we conclude, will fall something short of one ton to the acre. Yet some have small fields, that yield two tons to the acre, and a second crop in addition."

So in Middlesex: "Our most intelligent farmers think that fifteen hundred weight is a fair average, per acre."

These extracts might be multiplied, if it were necessary. They are not introduced, in any case, as showing the productiveness of the whole county, but only of particular localities

or towns. Upon the whole, after a careful consideration of the official returns, and of the testimony of the most competent individuals in all sections of the State, one is forced to the conclusion that the increase has been but slight, and that the average yield of this crop, per acre, does not much, if at all, exceed one ton, though, as one very sensible correspondent remarks, "No man who calls himself a *good farmer*, would feel satisfied with that amount."

In addition to the upland mowing, to which reference is made, the number of acres of fresh, wet meadow, was estimated, in 1840, at 184,822, yielding 135,930 tons of meadow hay; while in 1850 it was 180,490, yielding 133,821 tons.

The salt marshes of this State are worthy of special mention. Susceptible as they are to vast improvements, and at reasonable expense, it is a subject of astonishment that they are comparatively so much neglected. They produce, on an average, little over three-fourths of a ton to the acre, a large proportion of that being of inferior quality. It is believed that both quantity and quality may be greatly improved.

There are no less than 40,667 acres of salt marsh in this State, as appears by official statistics, and these produce but about 33,575 tons of hay! Situated as these marshes often are, at a distance from the owner's residence, often requiring great labor to make and secure the hay upon them, they can hardly be said to be of any real value in their present condition, the cutting, curing and carting home, costing more than the value of the crop of hard and wiry hay, little relished by the cattle along the shore, which are obliged to consume a large proportion of it.

There are other marshes, however, much superior to those, very frequently met with, the hay from which is excellent, nutritive, and much relished by animals fed upon it. To show what may be done in this important line of improvement, attention is respectfully called to the following statement from a farmer of Norfolk County, whose marsh, of fifteen acres, is situated on the Neponset River, in Dorchester. He says:—

"It was owned, for many years, by one of the best farmers in the county, (now deceased,) who expended nothing to improve its value. It was similar to other marshes in the vicinity, that

never had been ditched. I purchased it in 1840, which year it produced rather less than half a ton, per acre, of poor, short, wiry hay, worth but little more than the cost of cutting and curing. In the autumn of that year, I hired faithful laborers, well skilled in the business, to cut ditches over the whole lot, two rods apart, eight inches wide and three feet deep; the sods taken out, were laid in piles, to prevent the tide from washing them away. The two following winters, they were taken upon a sled to the cattle-yard, where they remained until the roots of grass contained in them were decayed, so as to break in pieces readily. For manure, and as an absorbent, they are as valuable as the best of meadow muck or peat.

"I paid for ditching the entire lot, ninety dollars; more than one hundred cords of sods were dug out and carted away, which I consider worth as much to me, as the sum paid for ditching. They were placed in the barnyard, in a compact form, to insure a proper degree of moisture and cause a speedy decomposition, and afterwards mixed with animal manures.

"Three years after ditching, the produce was double—full one ton per acre, was cut, of an improved quality, since which it has annually increased. This year the produce, as estimated by good judges, was two tons per acre, including about five tons of second crop, cut from the best part of the marsh. As an evidence of the quantity cut this year, I would state, that the produce has been sold for three hundred dollars in cash, after the owner had used nearly one ton for feed for his cows, the purchaser agreeing to take it at the barn where it is now stored.

"I consider salt hay, when cut from marshes that have been ditched, *where the grass is thick and the yield large*, to be worth as much as the average of upland hay; that cows thrive as well, and give as much milk, as when fed with herds-grass and clover hay.

"It is my belief, that all marshes can be made more productive by thorough draining, at a very small expense. I intend, next autumn, to cut ditches upon my own marsh, between those heretofore made. My opinion is unchanged, that the sods are worth as much as the expense of ditching, when within one mile of the farm where they are to be used."

When such improvements as these may be effected at so little cost, compared with such results, it is to be hoped that the salt marshes along the eastern shore, will be no longer neglected.

It may be remarked, that the comparative value of salt hay, as stated in the above communication, is considerably higher than the general estimate. How far the improvement in quality, and the use of it in connection with other hay, may justify this estimate, will be left for the reader to judge.

Wheat.

Some parts of the State are still devoted to the raising of wheat. It is well known that this was formerly an important crop, and extensively cultivated. The quantity produced has decreased gradually for some years. In 1840, this crop in Massachusetts amounted to 101,178 bushels, while in 1850, it was reduced to 28,487 bushels; showing an average annual decrease of about 9,269 bushels. In those parts of the State where it is still raised, however, it seems to be a remunerative crop. The average yield per acre is stated at $17\frac{5}{7}$ bushels, while in many localities it is 20, and even 25 bushels per acre.

The yield in the western part of the State, and indeed in all parts of the State where it is still cultivated to any extent, is greater at present than it was in 1838, in competition for the bounty of the Commonwealth. It should be borne in mind, however, that the season of 1838 was remarkably unfavorable, on account of the extreme drought, and that the crop of wheat was universally affected by it.

That the cultivation of wheat can be made reasonably profitable in this State, there is little room to doubt, after the full and reliable statements which have often and recently been made. Yet many farmers think that they cannot raise it for sale, so as to compete with the western farmers, whose soils are supposed to be naturally better adapted to this crop. On the other hand, it is said, that the soil of this State was originally well suited to it; and that, by treating it properly, good and remunerative crops may still be obtained.

Rye.

The amount of rye raised in the State, in 1840, was 453,705 bushels. In 1850, it was 441,208 bushels. This crop has been cultivated in Massachusetts from an early date. It was introduced in 1632–3, and at that time, cultivated on a very small scale. Wheat was then raised only in gardens, and even there it was very rare; though in the course of ten years, it was found to succeed so well as to lead to the proposition to export it largely to England.

The rye crop has greatly risen in favor, in some localities, within the last few years. It is even thought by some, to be the most profitable on the farm. This is undoubtedly, in part, owing to the high price of straw, during the past two or three years, making the profit from that alone, equal, or nearly equal, to the price of the rye itself.

The opinions and the experience of individuals differ so widely, that it would not be possible to give any statement of the comparative profits of this, and other grains, which would be of universal application and value.

The average yield per acre, throughout the State, as returned to me the past season, is but $14\frac{1}{3}$ bushels, though more of it seems to have been raised than in 1850.

Barley.

The average yield of barley in the State, is about 21 bushels per acre; but it is not so much cultivated as rye. The number of bushels returned to the Valuation Committee, in 1840, was 149,004 bushels; in 1850, it was 117,441 bushels, showing a falling off in ten years, of about 31,563 bushels.

Oats.

A smaller quantity of oats also is raised in this State, than formerly. In 1840, it was about 1,226,300 bushels, while in 1850, it was 1,210,238 bushels; showing a decrease of 16,062 bushels in ten years.

The yield of the last season averaged about thirty bushels to the acre.

From the facts which have been stated, it will be seen, that wheat, rye, barley and oats, are much less cultivated now than they were twelve or fifteen years ago. The same may be said of potatoes, as will appear hereafter. This decrease may be accounted for, by the greater attention paid to some other crops, and affords further evidence of the direction which the labor of our farmers is taking. Indian corn and hay are the only crops yet mentioned, which have increased to any considerable extent in this Commonwealth.

Potatoes.

There are no means of obtaining any exact information in regard to the potato crop of the State. It was not included in the returns of 1840 or 1850, and we can judge of it only from the letters received in answer to the inquiries made by me. From these, we find that, in the whole State, the number of acres devoted to potatoes, is less than one-half, or more nearly, about one-third of the number of acres devoted to corn. If we estimate the quantity of the latter, raised the past year, at 2,525,441 bushels, which probably is not far from the truth, and allow 35 bushels to the acre, we have about 72,155 acres of corn land. Supposing one-third as much land to be planted with potatoes, we have about 24,051 acres devoted to this crop. At the rate of 100 bushels per acre, which is probably rather below the average, we have 2,405,100 bushels of potatoes, as the yield of the State. This estimate, of course, is only an approximation; but so far as we can judge from the information which we have, it must be very nearly correct.

Most farmers place but very little reliance on this crop. So extensive were the ravages of the disease to which it has been liable for a few years past, during the last season, that it is likely to receive even less attention hereafter, than it has heretofore. This disease has baffled all the efforts, both of scientific and of practical men. Almost every individual who has investigated the subject, has advanced a theory of his own, respecting it. Each of these theories has more or less of plausibility, but unfortunately, when they are tested by experiment, it is found that the true cause of the disease is yet to be discovered.

So much interest is now felt in the subject, however, that some satisfactory result will probably be arrived at finally.

The phenomena connected with the disease, are often of a remarkable and striking character. In one instance, during the past season, the potatoes were sent off to market in a state of apparent soundness, to the great satisfaction of the owner. Before they had reached their destination, which was but a few miles distant, the whole load had become one putrified mass. In some single cases, which have come within my observation, there has been a loss to the owner of nearly one thousand dollars, from this cause alone.

Without attempting to explain facts which have baffled the research of men far better fitted for the investigation than myself, it may yet be allowed me to suggest that it would be well to use less of the green ammoniacal manures, which have so generally been applied to the potato. It has been said that the natural vigor of the plant has been destroyed by the unnatural treatment it has received; and though this may not be the direct cause of the disease, it renders the plant more liable to be effected by those sudden atmospheric changes which are thought to precede its appearance. This seems not wholly improbable, and further experiments in propagating from the seed, instead of the tuber, and in furnishing the plant with a larger supply of potash, by the use of wood ashes, may yet lead to a remedy. The territorial extent of the disease may be seen from the reports of individuals in different parts of the State. One writing from the southern part of Berkshire, says:—"Potatoes have generally been with us a good crop; this year, on account of the rot, they have done badly. Our farmers raise from one to three acres each, with an average yield of about one hundred bushels per acre."

In another part of the same county, on the ridge of the Green Mountains:—"Potatoes, before the rot, gave an average yield of two hundred bushels or over, and a profitable crop to feed, or sell at one shilling per bushel. Late years, a very uncertain crop. This year, an average of less than sixty bushels per acre. Mine have cost me fifty cents per bushel, and it is all they will sell for."

In the western part of Worcester County, it is said:—"The

average yield of potatoes is about one hundred bushels to the acre, for the past year. They are usually planted, since the rot commenced, on dryish land, and without manure."

In Middlesex:—"Not so many potatoes cultivated now as formerly, on account of the rot."

And in another part of the county, a correspondent writes: "Potatoes do not yield more than half as many bushels as they did from thirty to fifty years ago. From one hundred to one hundred and fifty bushels to the acre, for seven years past, have been as many as old lands would average. A neighbor told me that he produced, in 1852, five hundred bushels to the acre on reclaimed swamp land, where the mud was from two to ten feet deep—an inducement for others to try to do likewise."

It must be evident that the potato crop has not only greatly diminished in quantity throughout the State, the decrease being caused, no doubt, by a want of confidence in it, and a consequent disinclination to cultivate it; but the yield, per acre, where it is still planted, is much less than it was ten or twelve years ago. The yield in Great Barrington, for instance, fifteen years ago, is stated to have ranged from one hundred and seventy-five to three hundred and twenty bushels to the acre, while it is returned by reliable men as having been only about one hundred bushels for the past season. The same difference is found in many other towns, and the returns generally confirm the opinion expressed above.

Root Crops.

A striking feature in the present state of our agriculture, is neglect of the root crops as farm products. In some sections, it is true, a few fields of carrots, turnips, onions, or mangel-wurzel, are to be found, but they are not often seen to any extent, and for the most part, farmers raise them only in sufficient quantities to supply the family wants. It seems impossible that this neglect can arise from ignorance of the value of root crops as food for cattle. It is well known that the fattening properties of some of the roots, are very considerable, as is also the effect which they have in increasing the quantity of milk given, while their occasional substitution for the fodder

more commonly given to stock during the winter, is admitted to be conducive to the health of the animal.

Perhaps it may be more properly ascribed to the labor required for their successful cultivation. In many instances, this is, undoubtedly, a serious obstacle, and yet if these crops were fully appreciated, this objection would not be allowed to outweigh their advantages.

The amount of nourishment contained in the various articles used as food for cattle, is now tolerably well ascertained; though from the nature of things, as the difference in climate and temperature in which they come to maturity, and other causes, there must, of course, still be some degree of uncertainty about it. From recent experiments, very carefully and skilfully made, it appears that two pounds of raw potatoes afford as much nourishment as one pound of good English hay. So three and two-fifths pounds of beets, or three and one-half pounds of ruta-bagas with the leaves, or three pounds of carrots, are of the same value as one pound of the same hay. Thus, if we suppose an animal to require twenty-four pounds of hay per day, the place of half that amount of hay, or twelve pounds, might be supplied by twenty-four pounds of raw potatoes, or thirty pounds of carrots, or forty-two pounds of ruta-bagas with the leaves, or by sixty pounds of turnips with the leaves; with either of these equivalents, the animal would be equally well fed. This calculation, of course, supposes the articles used to be of ordinarily good quality.

If these nutritive equivalents are correctly stated, it would be easy to show the economy of a more extended use of root crops.

If we assume eighteen tons, or about seven hundred bushels of carrots as the product of an acre, which for a good season, and with good culture is a small yield, we have from this one acre, what is equivalent to six tons of hay. Somewhat similar results will be shown by an examination of the relative value of hay and other roots. Land devoted to carrots would undoubtedly require more labor than the same extent of mowing land; and yet, with the aid of boys in weeding, or with the simple and cheap implement, called the onion weeder, so admirably contrived as to enable the operator to weed care-

fully and well, a large extent may be cultivated at comparatively little cost.

The returns show what attention has been paid to the culture of root crops, and give the results. A correspondent in the county of Middlesex, writes thus:—"For a few years past, there has been more attention paid to raising carrots for stock, than formerly. We think they save about one-half the grain necessary for working horses, and are preferred to ruta-bagas for cattle. The average yield of carrots to the acre, is about six hundred bushels."

The yield in one or two instances in Norfolk County, is stated as follows:—"There is more attention than formerly, paid to the cultivation of root crops. Yield of beets and mangel-wurzel, 800 bushels; carrots, 800 bushels; ruta-bagas, 450 bushels; onions, 400 bushels; Norfolk turnip, 400 bushels; parsnips, 400 bushels."

In Berkshire County:—"Not much attention has as yet been paid to the raising of carrots and other roots as a field crop; some of our farmers have gone into it quite extensively, and others, seeing the good resulting from it, are fast following after."

In Dukes County:—"But little attention is paid to raising field crops of beets, carrots, ruta-bagas, &c. Average yield, per acre, of beets, 500 bushels, and carrots 500."

Another practical farmer writes:—"Within five years some attention has been given to raising carrots, and not much to either of the others, beets or ruta-bagas. Yield of carrots about 550 bushels per acre;—this crop not so promising this year as last; the tops die and turn black this year, like the diseased potato vines."

In Franklin County, a correspondent informs us that "There is but little attention paid by our farmers to the cultivation of field crops of beets, carrots, ruta-bagas, &c., though more than formerly. The estimated average yield, per acre, is about 800 bushels. These crops might be profitably cultivated here, if our farmers only understood the matter better, and would give attention to them."

In some parts of Essex County, the culture of roots has, perhaps, received greater attention than in most other sec-

tions of the State. A correspondent, whose great observation entitles his judgment to high consideration, writes as follows:—

"In reply to your inquiry, what are the crops chiefly cultivated on the lands in your vicinity, I beg leave to state: in addition to grass, and the various kinds of grain, much attention is given, of late, to the growing of vegetables—particularly the onion. More money is annually realized from this, than any other vegetable product. Not less than one hundred thousand barrels are annually grown in this town, and sent to market, chiefly to Boston, whence they are shipped in all directions. The product, to the acre, varies from three hundred to seven hundred bushels—according to the attention given to fertilizing and preparing the land for the crop. No product demands greater care in the cultivation, or better rewards it when applied. It is not uncommon for an individual to realize three hundred dollars and more, for his own labor in growing this crop, in a single season. Excepting some of the herbs and vegetables for the supply of the market, there is no crop with us that pays better. This crop is not confined to this town; many of the adjoining towns grow onions in large quantities, though not so many as in Danvers."

These extracts from different sections, show how little attention has been paid to the roots throughout the State. They are comparatively little valued, and, with few exceptions, as field crops they are hardly cultivated at all.

This is regarded, by some, as one of the most agreeable branches of husbandry, and the more it is followed the more it will commend itself to the consideration of practical farmers who are so situated as to be able to attend to it.

The root crops are so highly appreciated in England, that their introduction has often been said to have created a revolution in the agriculture of that country. Nearly three millions of acres are annually appropriated to the turnip, and the annual value of this crop amounts to nearly two millions of dollars.

Fruit.

Another characteristic of the agriculture of the present time, as compared with that of a former period, is the much greater attention now paid to the cultivation of fruit. The early settlers made some attempts to introduce the best varieties of apples and pears known in the mother country when they left it. For this purpose, some brought with them the seeds of these fruits, but, to their astonishment, they found that the product of the trees which sprung from them was very different from what they expected, and in many instances inferior to the fruit from which the seed had been taken. They did not understand how this could be, as they did not know that the seedling is often inferior to the fruit whose seed is sown.*

Their progress in this department, as might have been expected, was slow; indeed we can hardly say that fruit was cultivated at all as a part of the produce of the farm, and with a view to profit, till a comparatively recent date. Half a century ago it would have been impossible to find the number of varieties of good fruit in the whole State, which may now be found in a single town. There were orchards, it is true, and some of them were better than none; but this is all that can be said. Cider apples occupied a very prominent place in the list. The Hubbardston Nonesuch, the Minister, the Porter, and other favorite varieties, had then no existence. Not a nursery containing trees for sale, was to be found in the State. Here and there was an instance of grafting, but it was rare, and generally no thought was given to the subject. It was regarded as absurd, for any but a young man to set out trees. An incident in the life of the venerable Mr. Cobb, of Kingston, not inaptly illustrates the feeling which formerly prevailed to a great extent throughout the State. At the age of seventy years, he began the work of setting an orchard. The idea was so ludicrous as to subject him to the ridicule of the neighborhood. He lived to the age of one hundred and seven, and died

* The earliest fruit raised, was on Governor's Island, in the harbor of Boston, from which, on the 10th of October, 1639, ten fair pippens were brought, "there being not one apple nor pear tree planted in any part of the country, but upon that island."

in 1801, having enjoyed many years the fruits of his labors. Grafted trees were now and then obtained from another State, where somewhat greater attention had been paid to raising them; and a few orchards, nearly fifty years old, now bear some good fruit, notwithstanding the neglect and abuse of subsequent owners.

In the cultivation of fruit on the farms of this State, with reference to profit, the few great staple varieties are mostly relied on, while the choicer and more delicate kinds, which require much time and care to bring them to perfection, are left, for the most part, to the horticulturist, who is fully able to supply the limited demand for them.

To make such fruits profitable to the farmer, he should deal directly with the consumer. As things are, the producer often gets less than his proportion of the price paid, while the consumer, on the other hand, frequently pays far more than he ought.

It is the more common varieties of fruit, therefore, for which there is, and always will be, a good demand, that are grown on the farm.

Fortunately, the habits and character of these varieties are now pretty well known, and the farmer can judge which of them it is most for his interest to grow. He knows, for instance, that certain apples, as the Baldwin, produce in alternate years, and then very abundantly; so much so, indeed, that the market is overstocked, and prices fall. The intelligent farmer would naturally make his calculations with reference to these facts, and avoid such casualties by selecting for his orchards such apples as the Hubbardston Nonesuch, the Minister, or others of equal value, which will find a ready sale when the Baldwin and similar varieties are selling at the lowest prices.

The fact that these things sometimes occur, does not prove that fruit is not profitable, as is sometimes argued. If any one fails to make by it, he should rather consider it as an indication of some want of prudence or foresight on his part, and though he may not be willing to see or acknowledge it himself, it will still be evident to all who look on with a full knowledge of the fruit market.

To show how great attention is now devoted to this pleasant

branch of rural economy, the following short extracts may be given.

An intelligent farmer of Franklin County, writes as follows:—"The cultivation of fruit is prospectively most important to the farmer's interest, and the farmers are just beginning to learn it; there is no other way by which land can be made so profitable as by raising fruit, and our land is well adapted to the cultivation."

The same may be said of some parts of the county of Worcester, where "fruit of all kinds has, within the last fifteen years, received great attention, and been attended with most beneficial results, yielding to the farmer the most net profit of any thing that he could cultivate. Choice apples are raised in great abundance—except this year, the new edition of worms has produced almost an entire failure."

Another from the same county, writes:—"Great attention has been paid to the cultivation of fruit, particularly the apple, within the last few years. The soil is peculiarly adapted to fruit of all kinds, it being a deep yellow loam, and the surface grealty diversified. Peaches are generally, and in some instances, extensively cultivated. Pear culture is receiving very much attention, and quinces are raised, more or less, by every body. With many farmers the profits of the farm have doubled within the last ten years."

In the county of Middlesex, also, the farmers are paying greatly increased attention to this subject, and find it profitable to do so. A correspondent writes as follows:—"Considerable attention is given to the cultivation of fruit. There are some valuable old orchards, producing the Baldwin and Hunt Russet in abundance. Great numbers of young apple trees have been set within the last six years, and are receiving excellent care by careful pruning and the constant cultivation of the ground. Garden fruits, such as peaches, pears, plums, currants, gooseberries, blackberries and raspberries, have also recently received a degree of attention unknown here, until within a few years. There is no doubt among our cultivators but that these fruits materially increase the profits of the farm."

From another town of the same county, the following return was made, showing also the great attention which this subject is receiving:—

"More attention is paid to fruit culture, than any other branch of agriculture, and with great success—especially peaches, which thrive exceedingly well here; about 5,000 bushels were raised the past season. Apples, and other fruits do well. It is generally considered, that fruit trees pay for themselves, including care, cost of trees, &c., in about twelve years; and I think a great part of the time bestowed on an orchard is clear gain. All should plant an orchard who have land; I can assure them more profit thereby, than from any other branch of agriculture."

In the county of Hampden, though less interest is felt in fruit than in some other counties, it is now beginning to excite attention. One practical farmer writes from there, as follows:—"People have paid considerable attention to the cultivation of fruit, for a few years past, and I think with pretty good success. I have done as much in the way of raising fruit, as any man in our town, and I can say that I get more net profit from my fruit, considering the labor, than from any other products of my farm. We are seventy miles from Boston; we can pick our apples one day, and have them in Boston market the next."

The county of Norfolk is peculiarly adapted to the raising of fruit, from the nature of its soil, its vicinity to the best of markets, and the facilities which it has for selecting the finest varieties. An intelligent, practical farmer, writes thus:—"Much attention is given to the cultivation of fruit. A good orchard of apples, in full bearing, would probably increase the profits of a farm one-third; and where a variety of fruit is successfully cultivated, the increase of profits would be one-half, perhaps more."

Another in Middlesex County, says:—"Considerable attention has been paid to the cultivation of fruit, particularly apples and peaches. We send to the Boston and Lowell markets, about six thousand bushels of peaches, and, in bearing years, about six thousand barrels of apples. We consider hay, fruit and wood, more profitable than any thing we can raise."

In Essex County, fruit has received "much attention. The best kinds of apples, pears, peaches, plums and quinces are raised in abundance."

In this county, the cultivation of fruit is of early date. The oldest pear tree in the State, still stands a constant bearer, having been imported from England by the celebrated Governor Endicott. Importations were then very rare, most trees being propagated by the seed. This tree is now more than two hundred years old. It is a Bon Chretien, though of inferior quality. The exact date at which it was set out is not known. The grant of the land on which it stands, was made to Governor Endicott in 1632; and, not many years after that, he had a nursery of young trees not far from the spot where this tree now stands. Some of these trees he is known to have sold to his neighbors, who generally paid in land, the price being sometimes, two acres a tree.

The St. Michael's, St. Germain, Brown Beurré and some other fine foreign pears were known and esteemed in this county many years ago. These varieties were probably far better when first introduced into the county, than they are at present. In new lands and mild climates, they are ordinarily better than in older soils and colder climates, where they are apt to be inferior.

The Cranberry.

The interest in this valuable fruit has become so general, and the desire for information, now scattered and inaccessible to the majority of inquirers, is so great, that particular attention has been given to the collection of all that can be useful and valuable in regard to its natural history and cultivation. With this view, nearly a hundred acres of cultivated cranberries have been visited in different sections of the State.

The cranberry is too well known in New England to need description; but, it is so short a time since attention has been called to its cultivation, that many questions connected with it may be regarded as still unsettled.

Its Natural History.—There are two prominent and well known species of this fruit; the small or European, (*Oxycoccus palustris,*) and the common American cranberry, (*Oxycoccus*

macrocarpus). This plant was formerly classed as one of the whortleberry genus, (*Vacciniæ*,) but is now considered by many scientific men, as forming a group of four or five species, of which, the two mentioned above, are most commonly known.*

The roots of the small cranberry are creeping, with many stems, which are very slender, wiry and trailing, with many leafy branches. Its leaves are alternate, small, perennial, somewhat oval, rolled back at the edges, erect on small stalks. They are glaucous, or of a grayish color underneath. The flowers are small, drooping, and very beautiful; each consisting of four distinct petals rolled back at the base, of a deep flesh color, on simple red stalks, which have two or more very small, imperfectly developed leaves or bracts. The berries of this species are small, being about as large as an ordinary sized pea. In the early part of their growth, they are spotted, very much like a sparrow's egg, the spots being a little smaller, but, finally, in favorable situations, turn to a deep red. They have an acid taste, and are much used for tarts and jellies. It delights in marshy bogs covered with moss. It grows in great abundance in Russia, Sweden, Germany, and to some extent in Scotland and the north of England. It is also found in Nova

* There is a plant called the Highbush, or High Cranberry, (*Viburnum opulus,*) indigenous to North America, found on uplands in Maine, and along the St. John's River, and in some parts of Massachusetts. It is a beautiful shrub, sometimes ten or twelve feet high, having a white blossom, and a fruit somewhat smaller than the common cranberry, perfectly red, and of an acid taste, well adapted for tarts, pies, &c., for which it is often used. The fruit differs from the common cranberry, in having a small oblong stone instead of seeds. It is easily propagated by seeds, layers, or cuttings, and is often found as a garden shrub, flourishing in every variety of soil, sands and clays, wet and dry. Its berries grow in clusters and are persistent through the winter.

The plant, called in Maine, the "Mountain Cranberry," (*Vaccinium Vitis Idœa,*) has leaves shaped like those of our common cranberry, and bears an acid fruit used for the same purposes as our cranberry. It is very rare in this State, and where known, is called the "Cow Berry."

There is still another plant, (*Arbutus, Uva-ursi*—L.) found in abundance on Cape Cod, and there called the "Hog Cranberry." This is the Common Bearberry. It is not properly a variety of the cranberry, but belongs to a different genus. Its leaves, are in shape, much like those of the cranberry, and it is trailing like that plant. Its fruit is red, but smaller than the cranberry, and is used for medicinal purposes.

All these plants have come under my personal observation and study.

Scotia and New Brunswick, and that vicinity, where it bears very abundantly, and along the St. John's River, to a great distance from its mouth. It is met with in some parts of Massachusetts also. I observed it in the swamps of Provincetown, where it is called the "spice cranberry." It is imported into England, from Sweden and the north of Europe, in large quantities, and though with us it would be considered as far inferior to our common cranberry, it is more esteemed by many.

In Sweden, it was formerly common to boil silver plate in the acid juice of this berry, that it might eat off the minute particles of copper alloy.

The common American cranberry is a native of North America. It grows and flourishes in mossy swamps and bogs, as well as on sandy soils, from high northern latitudes, to North Carolina on the south, and to Minnesota on the west, where it produces very abundantly every other year, and is not excelled in size or flavor by cranberries in any part of the country. It is bought in large quantities of the Indians.

The stem of this species is larger than that of the small cranberry just described, and is commonly from a foot, to four or five feet in length. It is sometimes much longer than that. I have seen it from twelve to fifteen feet in length, throwing up many rising branches, sometimes to the height of eight or ten inches. The leaves are about one-half an inch long and nearly one-fourth of an inch broad, the second year, when full grown. On the new spring branches, which bear the flowers and berries, they are crowded towards the top. They are of an oblong, oval shape, the margin curved back, divided in the middle above and beneath by the costa, from which veins run to the margin. The flowers are frequently in pairs, very elegant, held towards the end of the new spring branches by erect, reddish stalks, much bent near the ends, giving them, together with the calix and flower-bud, before expanding, the appearance of a crane's neck, head and bill, whence it derives its name, craneberry or cranberry. The flowers continue to grow until immature berries are produced on the stem in July, and in some instances, even into August. The berries are of a yellowish green before ripening, and when ripe, of a bright scarlet or carmine color, and in some varieties, nearly black, or light and speckled with

deep red, varying in shape, from round to oval oblong, about one-half of an inch in diameter, of an agreeable acid taste, and often clinging to the vines during the whole winter. If gathered before fully ripe, they have not that delicious acid taste which they have at their maturity, and are, therefore, far less valuable than when left to ripen on the vines.

The cranberry grows naturally in watery bogs and morasses, and sometimes on high mountains. I have seen it growing luxuriantly and producing in abundance on marshes exposed to, and covered by high tides, on coarse sand, perfectly white and entirely destitute of organic matter of any kind, though accessible to moisture; on pure peat, on peat covered with sand, on dry, loamy and gravelly upland, and on the richest garden mould thoroughly tilled.

The American cranberry is exported very largely to Europe, though, as has been stated, it is not universally considered as equal to the Russian. It was found and used by the early settlers of Massachusetts, though not introduced into the Royal Botanic Garden, at Kew, till 1772, and comparatively little valued here, till within the last half century.

Analysis.—A valuable analysis of this fruit has recently been made, at my request, by Professor E. N. Horsford, of Cambridge. From this analysis it appears that the

Percentage of water expelled at 212° F., is .	88.78
Percentage of ash, " " .	.17
Woody fibre, tissues, organic acids and other organic matter not decomposed at 212° F., .	11.05
	100.00
Percentage of potash in the ash, . . .	42.67
" " soda, ...	1.77

This explains why this fruit flourishes so well on the sea-shore, where it derives its alkalies; the amount of potash, though small, may be derived from the sea.

From this analysis, it will be seen that only .17 per cent., or less than two-tenths of one per cent. of the cranberry is found in the ash, as inorganic matter, derived from the soil, all the rest being derived from the atmosphere and from water. The

results of experience are, therefore, strikingly corroborated by the deductions of science, that the cranberry will grow where nothing else will. It explains, too, how it is that this fruit seems to require nothing for its perfect development, but air and water, as will appear more distinctly hereafter.*

Modes of Cultivation.—The cranberry may be propagated from the seed, or from cuttings, or by transplanting. The last method is most frequently adopted. The first crop obtained by planting the seed, will ordinarily be a year or two later than

* The following is a detailed statement of the analysis referred to:—

ANALYSIS OF THE ASH OF THE CRANBERRY, *(Oxycoccus Macrocarpus.)*

The berries were dried in a steam chamber at 212° F., and from these the ash determined by slow combustion in a platinum crucible.

The qualitative analysis of the ash indicated the presence of the following substances: Potassa, soda, lime, magnesia, sesquioxide of iron, sesquioxide of manganese, sulphuric acid, chlorine silicic acid, carbonic acid, phosphoric acid, charcoal and sand.

The quantitative analysis of the ash gave the following results:—

Determination of the Water.

I.	9.4107 grms.	of	cranberries	gave	1.0165 grms.
II.	8.2052 "	"	"	. . . .	.9489 "
III.	9.2275 "	"	"	. . . .	1.0432 "

Determination of the Ash.

I.	8.4916 grms.	of	undried fruit	gave . . .	.0149 grms. of ash.
II.	8.1049 "	"	"	. . .	.0133 " "
III.	9.4107 "	"	"	. . .	.0173 " "

Determination of the Potassa.

0.811 grms. of ash gave 1.7917 grms. of potassio-chloride of platinum.

Determination of the Soda.

.811 grms. of ash gave .5748 grms. of mixed chlorides of potassium and sodium.
of which . . .5477 " was chloride of potassium.

and . . . .0271 " was chloride of sodium.

Determination of the Lime.

1.622 grms. of ash gave .2955 grms. of carbonate of lime.

Determination of the Magnesia.

1.622 grms. of ash gave .3122 grms. of pyrophosphate of magnesia.

Determination of the Sulphuric Acid.

.4971 grms. of ash gave .0521 grms. of sulphate of baryta.

Determination of the Chlorine.

.8008 grms. of ash gave .0423 grms of chloride of silver.

Determination of the Silicic Acid.

4.0549 grms. of ash gave .1950 grms. of silicic acid.

that produced by wild plants transplanted. It is, therefore, found to be more profitable to transplant, except in one or two sections of the State, where the interest in transplanting has been so great, that ten dollars a square rod is not an uncommon price for plants, where the ground is thickly covered. When it is desired to propagate by slips or cuttings, the usual practice is to gather a large quantity of vines and run them through a common hay-cutter, till they are reduced to the length desired, an inch or so, when they may be sown broad-

Determination the Carbonic Acid.

.4930 grms. of ash gave .0656 grms. of carbonic acid.

Determination of the Phosphoric Acid.

I. .4791 grms. of ash gave .0590 grms. of phosphoric acid.
II. 1.0433 " " " .1257 " " "

The foregoing determinations give the following results in one hundred parts:—

	I.	II.	III.	Mean.
Water,	89.19	88.43	88.69	88.78
Ash,	.17	.16	.18	.17
Woody Fibre, Organic Acids, &c.,	11.05	–	–	11.05

Composition of the Ash in 100 parts.

	I.	II.	III.	Mean.
Potassa,	42.67	–	–	42.67
Soda,	1.77	–	–	1.77
Lime,	10.20	–	–	10.20
Magnesia,	6.92	–	–	6.92
Sulphuric Acid,	3.60	–	–	3.60
Chlorine,	1.31	–	–	1.31
Silicic Acid,	4.81	–	–	4.81
Carbonic Acid,	13.31	–	–	13.31
Phosphoric Acid,	11.87	12.05	–	11.96
Charcoal and Sand,	1.15	–	–	1.15

Deducting the charcoal, sand and carbonic acid, the ash was found to be composed of

Potassa,	50.7956
Soda,	.7507
Chloride of Sodium,	2.5619
Lime,	12.1443
Magnesia,	8.2370
Sesquioxide of Iron,	1.2433
Sesquioxide of Manganese,	trace.
Sulphuric Acid,	4.2845
Silicic Acid,	5.7257
Phosphoric Acid,	14.2354
	100.0000

cast and harrowed in, though it is considered best, on some accounts, to sow in drills and cover properly. These slips very soon take root, starting from the base of the leaves, and at the same time shooting up many rising branches. If sown broadcast and harrowed, they should not be overflowed till the slips have taken root, as otherwise, many, remaining uncovered, will be floated off.

In the case of cranberries growing wild, it is a common and well-known practice to flow or cover them with water during the winter and early spring. This is very desirable, if the situation is such as to allow it, though it is not generally considered as essential by those who have been most successful. It is often useful, where there are facilities for flowing, to let the water remain a few inches deep till the spring is well advanced, (some think, till the first of May, or even later,) to retard the blossoming till there is no danger from frosts. Facilities for flowing are desirable in the cultivation of cranberries, also, and if the plantation could be so arranged as to flow very quickly, it might be of essential service, occasionally, during the spring or autumn.

As the cranberry, in its natural state, is more frequently found growing in a low wet swamp or marsh, that kind of land is generally selected for its cultivation.

The mode of setting out the cranberry in such a swamp, if we suppose it to be covered with bushes and grass, and surrounded by a sandy soil, or in the immediate neighborhood of sand, would be as follows: First, cut the bushes and pare off the surface turf to the depth of several inches, so as to remove, as far as possible, the roots of grasses and bushes; then level the whole by filling in sand to the depth of from two to four or five inches, according to circumstances. It is desirable that the surface of the sand should be but slightly raised above the level of the water of the swamp, meadow, or pond filled up, so that, by digging into the sand with the hand or the hoe, the water may be found within two or three inches of the surface. The plants should be taken up with the spade in square turfs, of the thickness of two or three inches, this being the depth to which the roots generally descend. When the ground has been levelled and prepared as directed above, it will be found

more convenient to draw straight lines and set the roots about eighteen inches apart one way, and one foot the other, in small clusters of about five or six together, the grasses taken up with them in the turf having first been removed from them. The practice of some has been to set the turf, thus taken up, into the row without removing the grass; but the vines are so tenacious of life that there is little danger of their dying, even if all their natural earth is removed from the roots; and those who have followed this method have generally had much less trouble in the subsequent cultivation. Some prefer to set them in rows at a greater distance apart, having the rows two and a half or three feet, and the plants one foot, in the rows. The distance may be regulated, somewhat, by circumstances. If the sand is thick and loose so as to make it impracticable to cultivate the vines and pull up the grasses and weeds, on account of the danger of starting the roots, the closer the plants are set, the better, since they will thus the sooner cover the ground and get the advantage of the grasses. Where it is not intended to hoe the plants in such situations, a foot each way will probably be the most convenient distance between the plants.

Many fields which I have seen, are thus arranged. Swamps like those described, which have always been considered as entirely incapable of improvement, have been reclaimed in many instances, with great labor, and filled up with coarse, white beach sand, and often, where the swamp has been covered with water, to the depth of three or four feet. The plants have then been set out in the manner described, from one foot to eighteen inches apart, in holes made in the sand by a small stick, hoe or dibble, and sometimes with the hand; a small cluster of roots taken from the sod in which they had been taken from their natural position, freed from grass and roots, being placed in each hole. In such a situation there will always be moisture enough for them.

The cost in these cases varies from $100 to $400 per acre. Under the most favorable circumstances, I have never known an acre prepared in this way, to fall below $125; and that, too, even where it has been prepared in the most economical way, all the labor being performed by the owner himself. The cost, in

the situations described, including the original preparation by paring, fencing, filling up with sand, procuring and setting out the roots, has more frequently been about $300 per acre. In many cases within my knowledge, the owner has contracted to pay at the rate of $1 87½ a square rod for preparing the land and setting out the plants properly. In somewhat more favorable situations, the contractor pays $1 50 a rod, or at the rate of $240 per acre.

When the roots are thus transplanted, a foot or a foot and a half being left between them, they are expected to spread and entirely cover the ground with vines, in about three years. If the plantation is troubled by grasses at first, the rapid growth of the plants will generally destroy them in the course of three or four years. In one of the most successful cases which have come under my observation, where the plants have been set about six years, the quantity of grass and weeds was much less the last season than the preceding; the vines produced abundantly, and there seems to be every reason to suppose that the cranberries will very soon take full possession of the ground. But if they are set sufficiently near, and have a proper amount of labor bestowed upon them, they will ordinarily, on sand, get an early hold of the ground and bid defiance to all opposition.

In some swamps and peat meadows, generally denominated "shaky," the surface is composed of a matting of roots, mosses, and various undecomposed organic matter; the whole of which seems to rest on a liquid, or almost liquid, bed beneath. This top matting may be thick and strong enough to prevent a person walking over it, from falling through. In such cases, the surface cannot very well be taken off, and the sand must be put upon the top; but careful consideration should be given to the quantity used, as, if too much be put on, its weight may sink the whole surface into the water beneath. Two or three inches will commonly be found as much as it is prudent to use. I have seen several examples where a neglect of reasonable precaution, in regard to this matter, has cost the owner the loss of all his labor and expenditure.

The mode of treatment which has been described, will be found to be the best for swamps surrounded by large quantities

of sand; and experiments, extending over a term of seven or eight years, with plants every year becoming more and more productive, show conclusively, that cranberries will flourish in pure white sand, if they are supplied with sufficient moisture.

If the position be a peat meadow, substantially the same course should be pursued. If very moist, it would, perhaps, be well to arrange suitable drains; and if these drains could be so constructed as to make it possible to flow the plantation in a very short time, it would, at times, be highly beneficial in preventing frost. The surface should be pared, the turfs being sometimes taken off and piled up for the compost, and sometimes turned directly over and left on the ground. As to the next step, in such cases, there is great difference of opinion, some preferring to cover the whole with sand—or gravel, if sand cannot be had—and others, to put the vines directly upon the peat bottom. The black soil, it is thought, is very useful in securing sufficient warmth in spring and autumn, as a protection against frost. This point has not been fully settled by experiment, so that it is impossible to say positively, that the one course or the other is the better. So far, however, all things being taken into consideration, the weight of opinion seems to be in favor of the former course,—covering to the depth of three or four inches with sand, or, where sand cannot be obtained, with gravel. This method very much diminishes the labor of hoeing, if it be found necessary, where the roots of grasses or bushes are left in the peat. Most cultivators prefer to hoe a little, sometimes twice or three times the first and second years after transplanting, or till the vines have trailed so as to make it inexpedient. The objection to transplanting in pure peat bog without sand, does not arise from the nature of the soil itself, which is, perhaps, as favorable, or nearly so, to the cranberry, as sand; but rather from the cause alluded to—the difficulty of hoeing, if the plants require it, when set in peat. The cranberry seems to have a wonderful power of adapting itself to any kind of soil; it draws its nourishment mostly from the atmosphere, though a liberal supply of moisture is desirable.

A somewhat simpler mode of procedure is sometimes adopted in the case of ordinary low meadows or swamps in the

country. If the meadow is covered with bushes and hassocks, the former are cut and the roots taken up with the grubber, and the latter are cut off level with the surface, when the vines being taken up from another part of the meadow or elsewhere, are set by first striking a hoe into the soil and raising it slightly, when the roots are inserted and pressed down with the foot. In this way, a large space may be quickly set with vines, which, under favorable circumstances, may cover the ground in three or four years. This method, it is evident, requires but little skill.

I have never seen more than one or two plantations with the roots set in the mud alone. In these cases, the soil had settled around them, leaving the plants standing on the ends of the roots, nearly out of the ground. So far as can be judged from appearances, they were by no means likely to grow; while close at hand was a piece covered with sand, on which the vines were very thrifty, with not a sign of failure. The mixture of sand had given the surface more consistency, and the plants had become well rooted and strong.

The experiments which have already been made, clearly show the practicability of raising cranberries on upland. I have seen flourishing plantations of them on all varieties of soils, from a high and light gravelly loam, to a very deep, rich, garden soil. Indeed, the universal opinion seems to be, that such cranberries are better than those growing naturally in wet meadows. In the instances which I have myself seen, the land had been carefully ploughed and prepared, as it usually is for strawberries, or plants of that description. The plants were taken from their original situation in the manner described, in the sod, and freed from grasses and roots; they were then put into shallow trenches or drills dug for the purpose, about two and a half or three feet apart. In consequence of the large space left between the drills, constant and careful attention was necessary for two or three years, so that far more labor was spent on them than the same area of strawberries would have required.

In one case, the plantation was situated on a high and dry hill, in a light loamy soil, and no water was supplied except what they had from occasional rains. The vines nearly all

lived; but as the plantation was only three years old, and the rows too far apart, they had not wholly covered the ground, nor had they borne to any extent.

In the cultivation of cranberries, whether on upland or lowland, it is very important that the ground should be entirely covered by the vines as soon after planting as possible, not only on account of the great saving in labor, by thus preventing the growth of grass and weeds, but also, because very little fruit is commonly produced till the vines have thus spread over the surface. At the end of three years the whole ground should be covered; but in the instances of upland culture referred to, it was not so, though the plantation had been set at least three or four years. Probably, if the roots had been put but twelve or eighteen inches apart each way, the result of the experiments would have been more satisfactory in this respect. As it was, however, the yield in 1852, was one bushel to the square rod, when cranberries were selling readily at four dollars per bushel.

But, in estimating the comparative profits of the upland and lowland cultivation, it will be borne in mind that the labor on upland is greater, and the land more valuable for other purposes. The liability to frosts, is not, however, quite so great when the cranberries are in blossom. There can be no doubt that it will grow and do well on upland, and produce too, a superior fruit; but it seems to prefer a poor, sandy soil, full of moisture, such as can be best obtained by improving swamps, which, unless used for this purpose, are nearly worthless. Half an acre of cranberries, on a very rich upland soil has been estimated by the owner to have cost him, after being set four years, and including labor, interest of land, and other expenses of cultivation, about $300, or at the rate of nearly $600 to the acre; whereas, it has been seen that the roughest and most unpromising swamps may be reclaimed and set with cranberries at about half that amount. If the soil be a rich loam, as in the case above mentioned, the grass and weeds struggle very hard for the mastery, while on the poor and barren sand they hardly grow at all if the ground has been properly prepared in the first instance; so that the labor of cultivation is but very little, at most, and many think that no care at all is

needed. Thus, there seems to be much truth in the remark which I have often heard on this subject: "Give us sand and water enough, and we can grow cranberries to any extent." So far as my own observation extends, the fruit grown on pure white sand, is quite equal in point of size and firmness to that grown on upland. More experiments, may, however, show further advantages in its extended culture on upland.

It should be remarked that it will be well to spend sufficient time in planting the vines, to do it properly, since they will thus get an earlier start, and sooner cover the ground. In the case of one plantation, visited during the process of transplanting, after the sand had been filled in and levelled, a line was carefully drawn and marks were made in the sand, eighteen inches one way, and one foot the other, when holes were dug three inches deep by one man with the hoe, while another followed, dropping five or six roots into each hole, and after him followed a boy who pressed the sand carefully about them. In this way, an acre was quickly planted.

No manure is needed for the cranberry. Indeed, from what has been said, it will be evident that the poorer the ground the better. In the experiments which have come under my observation, where manure was used, it caused the coarse grasses to grow abundantly, to the injury of the cranberry plants, which were not apparently benefited by the manure. But in cases of upland culture, swamp muck is often used about the vines, and with apparent profit.

In the case of vines growing naturally, it will be found advantageous to spread over them occasionally, a thin covering of sand.

Time of Planting.—If the cranberry is to be raised from seed, it may be sown in the fall or in the spring. For some reasons the latter is preferred, and the month of May is selected. It is better to crush the fruit and separate the seed from the pulp, though the latter is not necessary. The berry is sometimes crushed and mixed with sand, by which means the sowing is made more easy.

If the plants are to be propagated by cuttings, the spring is considered as preferable. The ground should be moist, but not liable to be flowed immediately after planting.

But for the usual mode of transplanting the vines, the fall is generally preferred, though there seems to be no difficulty in making them live when transplanted at any season of the year. I have known them transplanted in the middle of summer, and to live and do well. But if the planting be done in the fall, they take root in the spring and grow more vigorously the first year, than they otherwise would. For this reason, if the ground can be made ready in the fall, it is desirable to have the vines set out then, and they will thus ordinarily have the start of those planted the following spring, by two or three months. If planted in the autumn, they will also bear a little the next summer, and the crop will increase gradually till the fourth or fifth year, when it seems to attain its highest yield. Circumstances may make some difference in the length of time which must pass before a full crop is obtained, as, if the vines are much choked up by grass, and retarded in their growth by want of care. The statement made above, both as to the time ordinarily required, and as to the effect of the unfavorable circumstances alluded to, is confirmed by the experience of many who have been engaged in the cultivation of cranberries long enough to have had opportunities of extended observation on the subject. There seems to be no reason why the crop should diminish after the fifth year, nor is it certain that it will, as a general rule; yet it is evident that if, at this age, the thrifty and healthy vines have covered the whole ground, they will be likely to bear to their utmost capacity. Probably, after the seventh or eighth year, it will be found to be well to rake or stir the surface under the vines so far as it can be done, or perhaps, to spread over them a thin covering of sand or loam.

The Yield.—The yield will vary according to circumstances, but about one hundred and fifty bushels per acre will be a fair average; though an acre in full bearing will often produce more than two hundred bushels. In a very large number of cases, a bushel to the square rod has been gathered without much trouble of cultivation. In one lot visited by me, more than three bushels to a rod, or at the rate of four hundred and eighty bushels to the acre, on two or three rods, were obtained from very thrifty vines on a peat bottom, with a thin

covering of sand. This must be regarded as a remarkable yield; and when the quality of the fruit is such as to command a ready sale at from nine to eleven dollars a barrel, which was offered for them the past season, this crop must be acknowledged to be very profitable.

Loudon remarks, that Sir Joseph Banks, after having imported the American Cranberry into England, raised, in 1831, three and a half bushels on a piece of land eighteen feet square. This is at the rate of about four hundred and sixty bushels to the acre.

It is probable, that for several years in succession, the average yield throughout the State would not be more than a hundred bushels per acre, if it were so great; being some years much more than that, and others much less, the number of bushels varying according to the accidents of frosts and winter.

The market value of this fruit will also be different in different seasons. In 1852, four dollars a bushel, for cultivated cranberries, were very readily obtained. During the past season, the price has ranged from two to four dollars a bushel, according to the quality; raising and falling, also, to some extent, according to the demand and the supply in the market.

The demand is rapidly increasing, and there can be little doubt that it will continue to increase as the superior quality of the cranberry, in some sections of this State, becomes better known. And if, owing to any circumstances, as competition from abroad, the value should fall to one dollar per bushel, it would still be a profitable and desirable product, especially when it is left to occupy its favorite barren and otherwise unproductive swamps and dead sands. There are few crops which, with the same amount of labor, will make so good a return.

Varieties.—There are but two species of the cranberry, properly so called, which are of much practical value, as has been already intimated in speaking of the natural history of this plant; yet of each species there may be several varieties, more or less permanent, according to the circumstances and manner in which they were produced, just as there are varieties of the apple produced by the accidents of cultivation, and which are not permanent; as, for example, if we plant the seeds of any improved and cultivated variety, like the Baldwin, we cannot

depend upon having, from the seedling, the same variety as that from which the seeds were taken.

The varieties of the cranberry have not been distinctly named, as most varieties of the apple have, and must be described, and can only be distinguished, by difference in shape and color. It is very important that the most approved varieties should be selected for cultivation, as they command a much higher price in the market. The large, round and black cranberry of Cape Cod and Cape Ann, sells for nearly a third more than the oblong and softer variety, more common in other parts of the State. It might properly be called the Black cranberry, so nearly does its beautifully shaded, deep red, approach to black. It is very hard, nearly as hard as a Baldwin apple, and will bear transportation to any distance. It keeps well through the winter, and even, in some cases, into the succeeding summer. Indeed, with a little care, good cranberries may be kept a much longer time, either dry in bottles, corked so as to exclude the air, or in bottles filled with pure spring water.

It is probable that the superior qualities of this variety arise, in a great measure, from peculiarities of soil and situation, and from the fact that it can remain on the vines till it is fully ripe, without danger from frost. The proximity of the sea, also, may have much to do with this superiority. From extended inquiries into the quality of the same variety, in different localities, I have been led to the conclusion that the sea air is, for reasons alluded to above, highly conducive to its perfect development.

There is an oblong cranberry, more common in the low, wet bogs of the country, softer than that which has been described, of a loose and rather watery texture, and shrinking much more in cooking. It is sometimes shaped like an oblong pear. Its color is a beautiful vermilion. It seems to be much more sensitive, and liable to injury by the frost, than the variety just described. These varieties are not constant, nor are they very perfectly marked, each occasionally having the characteristics of the other. Thus the black cranberry sometimes, though rarely, assumes an oblong or pear shape, and the oblong is sometimes found harder and better than it generally is, and of a deeper red. The fruit, indeed, assumes every conceivable

shade and shape, from the black globular, to the light and oblong or pear-shaped.

Since these varieties are not permanent, it follows that there is no certainty that the seed will produce a plant which will be similar to that from which the seed was taken. We cannot depend upon having a Baldwin apple from the seed of the Baldwin. The product may, indeed, be superior to its parent, or it may be inferior, but it will seldom be precisely similar to it. The seed of the black cranberry might produce the black, as it sometimes does. The same circumstances which gave such peculiar characteristics to the fruit from which the seed was taken, would probably give it the same. It is always safe and wise to select the best seed of the best fruit, of every description, to plant.

The question has often been asked, whether the two varieties, when brought together, would injure each other, or in other words, whether, if the black and the common oblong cranberry of the country, were transplanted into the same piece, and placed in the immediate vicinity of each other, the fruit of each would have all its original distinctive characteristics? If both varieties of vines ran together, as they naturally would, so that the dust or pollen of one would fall on and fructify the other, it is very probable that the fruit would have some of the characteristics of each variety. The inferior cranberry would, perhaps, be improved, and it is possible that the fruit so produced might be better than either alone would have been. Such is, to a great extent, the case with all accidental varieties of fruit; as when a variety of Indian corn, for example, is so situated that its pollen falls upon other varieties of the same grain, the effects are invariably seen in the different character given to the fruit of that on which it falls.

But, if our common American cranberry were intermixed with the small, or European cranberry, in the manner above described, the same amalgamation probably would not take place, from the fact that the species is different. There might possibly be an intermixture, but it would be very unlikely to occur.

The Cranberry Worm.—There is an insect which attacks the cranberry. Its history and habits are not yet fully known,

though the subject is now studied so closely that they will probably soon be determined. The egg is supposed to be deposited in the blossom. From this egg proceeds a small caterpillar, which works its way through the fruit, eating the pulp and causing the green fruit to turn red prematurely and decay. It bears a striking resemblance to the apple-worm, and seems to be very much like it in its habits. This similarity has been observed by Dr. T. W. Harris, as appears by a letter from which the following extract is taken:—

"Within the past two or three years, some complaint has been made of injury done to cranberries by insects. A sample of the injured fruit was put into my hands by the editor of one of our agricultural newspapers. The insects found therein were small, naked caterpillars, strikingly like those called apple-worms, or core-worms. Their habits seemed to be identical with those of these common depredators. Each of the affected cranberries had been tenanted by a single worm, which had entered, when very small, and had devoured more or less of the pulp, filling its path with its blackish excrements. Not having traced this insect to its final state, I cannot positively assert that it is the same species as that which affects the apple; but if not the same, it is probably congenerical or closely allied thereto. I am not acquainted with any other insect attacking the cranberry."

Others have observed a striking resemblance of the appearance and sensitive nature of this insect to the Palmer worm.

Two different remedies have been adopted for this evil. One is to flow the cranberry ground one whole year, thus losing the crop of one season, and the other is to sow salt upon the cranberry bed, at the rate of about five or six bushels to the acre. On plantations which cannot be flowed, the latter will probably be found to be the only effectual remedy. If what has been observed be true, that cranberries growing on or near a salt marsh are superior to any others, it is also natural to suppose this application of salt would be beneficial to the cranberries, even if it did not destroy, or prevent the ravages of this insect.

Mode of Gathering.—In this country, the cranberry is generally gathered with a rake made for the purpose, with

which twenty or thirty bushels a day can be taken from the vines. But on newly planted beds, or loose sand, there may be danger that this method will injure the roots, and it will not be found expedient, in such cases, to use the rake till the plants are very firmly rooted, and have covered the ground. But raking, in the majority of cases, so far from injuring the vines, is probably a benefit to them, when no other cultivation is practicable. In Germany, the small cranberry is gathered by means of wooden combs. In England and Scotland, where they are not found in so great abundance, they are generally picked by hand.

If I have dwelt longer on this subject than its comparative importance would seem to justify, it need only be stated that the cultivation of cranberries is fast becoming an important branch of our agriculture, more than one hundred thousand bushels of this valuable fruit having been gathered during the past season, from land which, for all other purposes, would have been comparatively worthless, while the demand for it here and in England is sufficiently large to absorb all that can be thrown into the market;—that the information on this subject was much scattered and inaccessible to many, and that great facilities were at my command for extensive and accurate observation of experiments, many of which had been tried so long that I could state conclusions resting on them, with some degree of confidence.

But, as I have before intimated, some questions relating to the culture of this plant, are still to be settled by experiment, and it is possible that time and future observation may require some modification of the opinions which have been advanced above.

Broomcorn.

There are still other products which are cultivated only in particular localities. These, however, should not be overlooked in an account of the agriculture of the State.

Among these, broomcorn is largely cultivated in the Valley of the Connecticut. This crop is increasing rapidly, as it is found to do well, and to be very profitable. The returns of 1840 show that only 580 tons were raised in the State, while in 1850, the

amount had increased to 1,291 tons. From much observation and inquiry, in the course of the last year, I am inclined to think that a much greater quantity is now produced. Probably it would average one-fourth more, making the present product of this crop over 1,600 tons.

The preparation of the ground for broomcorn is very much the same as for Indian corn. A carefully written statement furnished by a committee of a Farmers' Club, says:—"Upon the one hundred and eighty acres of broomcorn are grown fifty bushels of broomcorn seed, to the acre, which will weigh from thirty-five to forty pounds to the bushel, and worth one cent a pound. Upon this seed, mixed with corn, swine are fattened."

This estimate is based on the crop of the past season. The average yield, per acre, is from 500 to 550 pounds. In some towns it is greater, varying according to the difference of soil and culture.

Tobacco.

Nor would any notice of the products of this State be complete without an allusion to tobacco. The cultivation of this plant was recently revived in the Valley of the Connecticut. It has now become an important product in that vicinity. In one town alone, more than seventy-five acres were appropriated to it the past season. I have visited many very large fields during the last summer, to examine and compare the different modes of culture.

The following statement of the method of cultivation, kindly furnished me by one whose long experience and eminent success makes him perfectly competent to state the whole process, will give a better idea of it than any general remarks of mine. He says:—

"My mode is first to select a moist—not wet—piece of *rich ground*, and as early as spring will permit, prepare it as a bed in the garden. Sow the seed broadcast, at the rate of one tablespoonful to the rod. Then tread, or roll it hard, without any other covering. It is well to mix the seed with plaster or corn meal, that you can see that it is sown even.

"The plants should be kept free from weeds till large enough

to transplant. They should be left on the bed till they have a good leaf and begin to form a tap root. The ground for receiving them should be made rich and well pulverized, then set the rows three feet four inches apart, and at two and a half feet in the rows. Occasionally put two plants in a hill, that one may be taken out with the hoe at hoeing time, to fill vacancies. Should many occur, it is necessary to go over the field and reset from the plant bed. We go through the rows twice with the cultivator, and three or four times with the hoe, as the crop or weeds may require. The crop is left to grow till as much as possible will blossom without forming seed, then break every plant that will do, down to a good sized leaf. By this process the crop will ripen nearly all at one time. If you have late plants in the field, top them low and they will ripen with the early ones. All suckers must be removed from the time of topping till you cut it, which is usually about three weeks after it is topped. Cut with a hatchet, and let it lie on the ground till wilted sufficiently to handle without breaking the leaves. If in hot, fair weather, avoid letting it lie in the sun in the middle of the day, as sunburn injures it as much as a frost. I choose to cut about two o'clock, P. M., and near sundown lay it in hakes, about three or four plants in each, then hang it up the next morning. I hang on poles or rails, twelve feet long, with twine, from thirteen to fourteen plants on each side, making thirty-six or thirty-eight plants on each pole, and place the poles at least eighteen inches apart. Many hang it too thick, which causes it to sweat. This is a great injury.

"In the early part of the process of curing, give it all the air you can, taking care to close the building in the rain. When sufficiently cured, it is taken down in a damp or rainy time, and stripped, and sorted into two sorts—fillers and wrappers—and tied in hands from half to three-fourths of a pound each, and packed carefully down, tip to tip, till it is ready to case. It is then pressed in boxes of about four hundred pounds each. Much of the Connecticut seed-leaf—for it is known by that name—is shipped out of the country. Its great excellence is for cigars, and has, for the last few years, been sold from eight to sixteen cents per pound. A good average crop is sixteen hundred pounds per acre. I think I have

in no season of late, raised less than two thousand pounds per acre, and have sold all, both first and second quality, at my door, for fourteen cents per pound, the last two years. As to the cost of raising, I estimate one acre of tobacco to three of corn, which would yield fifty bushels per acre."

Another communication from Franklin County, will throw additional light upon this subject. The writer says:—

"In the first place, great care should be taken in getting plants large enough to set out as early as may be. If possible, I would commence setting as soon as the 8th of June, and finish as soon as the 12th or 15th; and in order to get plants large enough for setting, as early as that, a good warm spot of ground should be selected, and the north and west sides should be protected by a light fence or buildings. The manure applied in the fall of the year, and ploughed five or six inches deep; sow the seed as early as the season will admit, say from the 1st to the 10th of April, and at the same time top-dress with Super-phosphate of Lime, say four or five pounds to the rod; or I think that it would be advisable to apply the Super-phosphate of Lime previous to sowing the seed, and rake it in, as it will not answer to rake the bed after sowing the seed. I have known plants set as late as the 4th of July, and later, to mature; but my own experience and observation are decidedly in favor of early setting, as it is necessary that the crop should be all hung up as soon as the 10th of September, for fear of frost; and it needs the time then to cure before we have cold, freezing weather. It is necessary that every stem should be cured before the leaves are stripped off from the stalk, as in case of there being fat stems in the hands of tobacco, if they do not rot, they are sure to discolor it, and produce heat in the packs, before boxing.

"Last year, a large quantity of tobacco, which was sold to the speculators for large prices, ranging from twelve and a half to seventeen cents per pound, was by them rejected, on the ground that it was not properly cured before stripping."

In the town from which this statement comes, the average yield, per acre, is estimated at 1,550 pounds.

All the information that can be gathered, leads to the belief that the quantity annually raised in the State cannot be less

than one hundred and sixty tons, occupying about two hundred and twenty acres of land. It is thought by many to be a very exhausting crop. From what has been said, it will be seen that it requires very thorough and careful cultivation, and the free use of manure.

Flax.

There is another crop to which certain sections of this State are peculiarly adapted, both on account of their soil and their nearness to markets, where there is a constant and increasing demand for it. I refer to Flax. There was a time when it was cultivated in most parts of the Commonwealth in small quantities; but an impression grew up that it was an exhausting crop and very injurious to the land, and its culture was generally abandoned. It is now found only in a few localities, and that to so limited an extent as hardly to deserve mention as one of the present products of the State.

The demand for flax fibre in this country will undoubtedly lead to the study of the plant and its more extended culture, and experiments will probably prove it to be profitable in many situations. The farmers of the West find it for their interest to raise it for the seed alone. The amount of seed raised in the United States in 1850, was reported by the census to be 562,312 bushels. In 1852 there were about 250,000 acres in flax, producing on an average from eight to ten bushels of seed. The yield of seed must have been about 2,250,000 bushels. By far the largest portion of this is raised in the Western States, and though the fibre is worth nearly the price of hay, it is left in large quantities to rot on the ground on account of the expense of transportation, and because the old processes of preparing the straw made it necessary to take it from the field before the seed was fully ripe. New and improved methods of preparation have been lately introduced however, by which the process of preparing the fibre is very much shortened and simplified. By the present modes of preparation, the fibre of the mature flax may be taken and used, so that the cultivator can make his profit both on the seed and the straw. The introduction of new machinery into this State for the manufacture of flax, will give our farmers a great advantage over the western

producer, by bringing a market for his crop up to his very door.

The government of Great Britain has long encouraged the growth of flax, and is now paying an annual bounty of about $5,000 for the encouragement of the growth of this article. But that country cannot produce enough to supply the demand of her own people. In 1851 she imported about 124,784 tons of dressed fibre. She also imports flax seed and linseed cake very largely. Only about one-fourth part of the quantity of these products now used by her is produced in the kingdom. These facts are stated to show the great foreign demand for this article of produce, and must convince the candid inquirer that every grower will find a ready market for all he can raise.

Several establishments in this State are already engaged in the manufacture of linen goods of various kinds, at Andover. Willimantic, Clinton, Webster, Fall River and other places. Operations will soon be commenced in the vicinity of Springfield also. These manufactories will, of course, increase the demand for the raw material which they use.

Flax does not require a very peculiar soil, nor is it an exhausting crop. An alluvial soil, or what is commonly called a light sandy loam, is thought to be best adapted to it. The plant draws most of its nourishment from the air and from water. It is only the seed that draws upon soil to any great extent. The constituents, moreover, which the seed takes from the earth are easily returned to it by feeding out the oil-cake to cattle, and dressing the land with the stable manure.

In the cultivation of this plant more danger is apprehended from too great richness of soil than from its being too poor and light. If the soil is very rich, the fibre is frequently too coarse, and of an inferior quality. The custom which has prevailed in this country of allotting to it the richest parts of the farm may have given rise to the objection sometimes made to American flax, in England, that the fibre is too coarse for the best quality of linen fabrics.

In view of the many facts in regard to the cultivation of this plant which have recently been brought to our notice, I cannot but think that it would be well to try it on many lands which could be prepared for this crop at less expense than for others.

Among its other recommendations, may be mentioned the peculiar fattening properties of the seed, which have never been fully appreciated in this country.

But two tons of this product were returned as raised in 1840. In 1850 there were sixty-nine tons. The next valuation will probably increase this amount, and it is to be hoped that it will hereafter become a prominent article of produce among us.

Hops.

The cultivation of hops may be alluded to in this connection, though it is more confined than some other crops, to particular localities. The yield in 1840, was about 237,941 lbs. In 1850, there were only about 150,655 lbs.

Reclaimed Lands.

I have before referred to the progress made in reclaiming waste lands, and may now remark generally that, for some time past much attention seems to have been paid to it. In 1840, there were 955,283 acres of unimproved land, and 360,278 thought to be incapable of improvement; the whole number of acres returned being 4,491,812 acres.

In 1850, the returns gave 715,294 acres unimproved, and 257,929 incapable of improvement. These facts show a most gratifying advance in this important branch of agriculture. Waste lands have been brought under cultivation at the rate of 24,000 acres annually, and that formerly considered as hopelessly barren has been reclaimed at the rate of 10,000 acres annually.

The land in tillage in 1840 was returned as 259,038 acres. In 1850, it had increased to 300,269 acres, while the upland mowing had increased from 440,930 to 528,025 acres, and the pasture lands from 1,210,154 to 1,311,210. This makes the increase in tillage land 41,230$\frac{3}{4}$ acres; in upland mowing, 87,095; and in pasturage, 101,056; making in all 229,381$\frac{3}{4}$ acres. This shows how a very large part of the 239,989$\frac{1}{4}$ acres reclaimed in the ten years has been appropriated; the pasture land has been turned into mowing and tillage, and the unimproved land into pasturage or tillage.

The draining of lands, also, is receiving increased attention;

and this by means wet meadows, which were comparatively worthless, have become as valuable as any other part of the farm, and are more profitable than the older and more exhausted uplands. This gain has not been confined to one section of the State. It has been very general, though of comparatively recent date. In some few places, indeed, as early as a century ago, waste lands had been greatly improved, but very little interest was felt in the subject in the State at large, until within a few years. This would naturally be the case in a country not long settled. When lands are cheap and easily procured, those which require the least expenditure of labor are taken and used first. There is no occasion for high culture, such as we should expect to find in an old and populous country. When one field is exhausted, others are near at hand and may be had for the asking. As the progress of civilization and the wants of the people require it, attention is turned to making and reclaiming land. The sea and the marsh are filled up to meet the necessities of the city; the lake and the swamp to supply the wants of the country; and as new land is made, the old will be more highly cultivated. This reflection will force itself upon the observing traveller at every turn between Berkshire and Barnstable. To show the state of feeling existing to some extent in different sections, a few brief extracts may be given.

An intelligent writer in the southern part of Berkshire says:—"The drainage of and reclaiming waste and swamp lands, has engaged the attention of our farmers to a large extent. The amount of land so reclaimed within the time you named, has been from 400 to 500 acres, and the most of this has been reclaimed within a few years. The profit arising from it will, on an average, be about 50 per cent.; in some cases it is very large, and lands so reclaimed are now the best parts of our farms. Our Agricultural Society has taken the matter in hand, and is now offering handsome premiums to the reclaimers. The number of competitors this year was quite large, showing that the importance of it is beginning to be felt."

In Hampshire County, one writer says:—"I will give you the process of reclaiming our poor, worthless swamp lands. In the first place, we drain them as dry as we can conveniently,

and then we cut the surface over as even as possible, and in some cases we plough and level it, and then we draw on sand or gravel at the rate of about a cart load to a square rod of ground, and then cart on fifteen or twenty loads of good manure per acre, and spread evenly over the ground, and then harrow it thoroughly. After that sow it to herds-grass, clover, and redtop seed. The latter part of August is considered the best time for seeding, but it will do very well later in the season. Land reclaimed in this way, we consider the most valuable land we have; it will generally yield two good crops of first quality hay a season."

These are selected not as being the only writers who speak of this subject in this manner, but as giving in the main a fair representation of the general feeling in the different sections of the State. As we might anticipate, this feeling does not prevail universally. One writer in Bristol County, says:—"But little attention has been paid to reclaiming land; most farmers think it better to let the swamp and very rough land come into wood. A few have paid some attention to it, and find it pays well; but most farmers say they cannot afford it, labor is so high. I am of the opinion that not more than two hundred acres have been reclaimed." Others, in other sections of the State, use language very similar; still all seem to entertain the opinion that there is an increasing interest in this subject, a more earnest inquiry into the best processes of reclaiming, and a general impression that "it will pay." In short, men begin to see that we must have better lands and a higher degree of culture. When they carry out in their practice the conclusions which they now feel themselves forced to admit, our waste lands will be reclaimed to fruitfulness and beauty.

Improvement of Pastures.

As I have before intimated there has been an increase of the whole number of acres in tillage; yet in nearly one-half of the whole State there is a gradual and constant decrease, much of the land formerly tilled being given up to pasturage. In very many towns the number of acres in pasturage, also, is decreasing, many old pastures having become so poor as to be abandoned to bushes, or converted into woodland. The

following statement of the condition of things in parts of Essex County will apply equally well to some other sections of the State:—"Pasture lands for the last twenty years have been on the decrease. Except where they are ploughed and manured they become mossy, run over to bushes, and are rapidly getting into wood."

The number of acres in pasturage in 1840 was about 1,210,154. In 1850 it had increased somewhat, and the returns gave 1,311,210 acres, capable of keeping 273,301 cows, with the help of the fall feed they could get on the other lands. This calculation allows about $4\frac{3}{4}$ acres to each cow.

It is a fact too well known, and too generally admitted to be doubted, that many of our pasture lands are fast running out. They were long since exhausted by constant cropping; some of them for more than a century. Many thousand acres have furnished all the milk, butter, and cheese sold from the farm, without receiving so much as a pennyworth in return. In some sections of the State, however, the matter is now beginning to excite the serious consideration of farmers, and they are doing something to provide summer feed for their stock.

So far as can be ascertained, complaints of this difficulty are more frequent in the eastern part of the State than in the interior and western part, where much of the pasture land has been used less than a century, and some less than a half century; and where the greater attention paid to sheep husbandry has preserved them. In many fields and pastures of eastern Massachusetts the white-weed, or ox-eye daisy, has taken such exclusive possession that it can scarcely be eradicated. It has been found that this troublesome plant will not grow where sheep are pastured, however firm a foothold it may have gained before they are put on the land. If this be so, it would be judicious in many cases for farmers to engage in the raising of sheep, temporarily, at least.

In some parts of Essex County a plant is to be found commonly called wood-waxen—(*Genista tinctoria*)—introduced originally by Governor Endicott as a garden flower. It has spread over and taken exclusive possession of many hundred acres, and is more difficult to extirpate, and more troublesome than the white-weed even. Sheep eat this with great avidity,

often preferring it to the best of grass, and soon kill it. If cut and cured in the same manner, they prefer it to the best English hay. I state these facts respecting white-weed and wood-waxen only on the authority of others, and not from actual personal observation, but with the hope that they may be confirmed by the experience of those who may endeavor to rid themselves of these noxious weeds in the manner indicated above.

I have said that great care is required for the renovation of our pasture lands. The work has already begun in some sections, as one or two brief extracts will show. A correspondent in Worcester County, speaking of pastures in that section, says there is but little variation in the number of acres:—"In many instances farmers have suffered unproductive portions of pasture lands to be abandoned to wood, particularly the light soils, on which the pine readily springs up; while others have appropriated their vacant clearings to pasturage, thereby equalling the number of acres of pasture land. Farmers are now directing their attention to the improvement of pasture land, by ploughing thoroughly and seeding with herds-grass, redtop and clover, and using plaster very extensively, which suits most of the soil of the town. This application has been in use for many years, particularly on our hill lands. As the town is quite elevated and reposes on the granite formation, the use of plaster would be found valuable over nearly its entire surface."

Another in Middlesex writes:—"As our woodland increases, our tillage and pasturage diminish. A large proportion of land, formerly improved as pasturage or tillage land, is now under a promising growth of young wood, which is the most profitable crop we can raise here; it will grow without our paying laborers nine shillings a day to hoe up weeds."

These may be regarded as indicative of the attention paid to pasture lands in different sections of the State. In some places some real and positive improvement has been made—in others, no pains have been taken even to prevent deterioration. If, instead of absolute neglect, the farmer could plant the pine, and hasten the transformation into woodland, it might be the most economical disposition that could be made of these worn-out pastures; but the practice in the majority of cases is to leave them uncared for till the bushes get the possession; in

the mean time there is so little feed for the cattle that they attack the young trees, thus essentially retarding their growth, and very much prolonging the period during which the land must remain nearly unproductive.

Woodland.

The constant and rapid decrease of our woodland is often spoken of with serious apprehension. It is thought by some that the time is not far distant when our once beautiful forests will have been entirely swept away. They forget that the earth has now the same power of reproduction that she had in the beginning. If this fear be entertained only in relation to timber land, properly so called, there may be some ground for it. The wood in most of our forests is undoubtedly smaller than it was many years ago, or, in other words, a larger proportion of it is small compared with the forests of an earlier day.

The number of acres of woodland in 1840 was reported to be 729,792. In 1850 it had advanced to 896,450, showing an increase in ten years of 166,658 acres, or an annual increase of 16,665 acres. This does not look much like the entire destruction of our woods. The apprehension alluded to may have arisen from the fact that a large quantity of old and long standing timber has been cut within the last twenty years. The land formerly occupied by this is omitted in an unofficial reckoning, and considered as no longer woodland; it is forgotten that in such cases much of the land has been left to grow up again to forest. A large proportion of what has been converted into tillage, mowing or pasture land, has been reclaimed from bog meadows, swamps or ponds, while little woodland, comparatively, has been cleared and tilled, and many old pastures have become well wooded from neglect. Even in the county of Essex, where this impression prevails as generally as elsewhere, the official returns show a positive increase.

It is estimated that in Barnstable alone, one of the smallest counties in the State, nearly fifteen hundred acres have been planted with pines within the last fifteen or twenty years, while much pasture land has grown up from the gradual operation of the causes before referred to.

Thus, after making all reasonable allowance for any errors,

which may have crept into the statistics relied on, we may still anticipate that future returns will show the existence of the same causes now in operation, and that they will continue to produce the same effects which they have done hitherto, notwithstanding our growing population and the increasing demand for arable land.

A class of lands has been already mentioned, with a query whether it would not be true economy to make woodland of them, subjecting others less exhausted to cultivation in their stead. Many thousand acres of poor and worn-out lands may be found in the eastern part of the State and elsewhere, which, for all practical purposes of cultivation, may be considered as worthless, the net profits from them not being worth estimating. Such lands as I have intimated, have already been planted with pitch pine to a considerable extent; and as many acres have been visited for the purpose of examining the progress of the experiments, it is proper here to state the methods which have been pursued with success.

The pitch pine is adapted to a light sandy soil, or to one which has been exhausted by continued cropping. On such a soil it will do well, even in the early part of its growth, if no attention at all be paid to it; whereas, if it stands on rich land, with a deep mould and full of organic matter, the grasses and weeds too often check its early growth, if indeed they do not entirely destroy it.

The seed of the pine may often be purchased at about one dollar a quart. It is usually gathered in October by taking the new cones from the trees, before they have been opened by the frost, so as to allow their seed to fall. These cones should be kept free from moisture, and dried in the sun, or by artificial heat. When dry, the seeds become loosened and drop from the cones, or they may be threshed out. They are cleaned by rubbing and winnowing. In Europe it is generally considered better to sow thickly in beds; when about three years old the trees are transplanted. This course is not generally pursued here on account of the labor of transplanting, though if the soil were worth any thing for pasturage during these two or three years, it would probably be advisable to adopt it. The seed may be sown either in autumn or in early spring. Many use

the hoe for making the holes, and drop the seed by hand; others plough furrows six feet apart and drop the seeds in the bottom of the furrow from one to two feet apart. This requires too much time and labor if the plantation is to be very large. A simple machine has been contrived for dropping the seed at the proper distance, by which a man with a horse may plant five or six acres in a day, which is quite as much as he could plough with furrows at the distance of six feet in the same length of time. This machine costs from three and a half to five dollars.

About a quart of seed is generally allowed to four acres. If it be of good quality, this is commonly found to be a sufficient quantity. Probably, however, planting a little thicker would secure a more perfect exemption from any difficulty arising from accident or bad seed.

The transplanting of young white pines may be effected with safety at almost any season of the year, provided, in taking them up the bark of the roots is not strained and broken, or loosened. The roots may be cut off with much greater safety than their bark can be broken. By careful attention to this precaution more than a thousand young white pines were transplanted by a farmer in Bristol County, with the loss of only one or two.

Among other very valuable trees may be mentioned the yellow locust, on sandy land, both on account of its intrinsic value as wood, and the benefit to dry pasture lands. The Scotch larch, has also been planted, to considerable extent, and for rapidity of growth, value for timber and beauty, is one of the most desirable additions to the farm. The silver poplar on light soils and exposed situations, is also of great value, as are also the white birch, the chestnut, and, as an ornament unsurpassed, the graceful elm.

Manures.

As the necessity of a better culture begins to be felt, the preservation and application of manures must, of course, attract much attention. All eminent success in farming, in a great measure, depends upon them. Some, indeed, have gone so far as to say that the whole science of agriculture consists in pro-

ducing the greatest possible amount of manure at the least possible cost.

We have seen that it was the practice of the early settlers to use their lands till they would no longer produce remunerative crops, and then abandon them, to subject others to the same process. This was what might have been expected, from any people situated as they were. No account was made of manure. The only object was to get rid of it.

Much progress has, undoubtedly, been made by our farmers in this department of agriculture. By many individuals the subject has been carefully investigated, and far more manure is made, and that of a better quality, than formerly. In every part of the State, too, more care is taken to enclose the cattle in summer, to cover the manure heap in winter, and to supply the sty—the laboratory of the farm—with muck and loam. But our lands require more manure than they did a century, or even a half century ago, and progress in this direction has hardly more than kept pace with our increasing necessities. We should not be content to keep our lands merely as good as they were when they came into our possession. Every energetic and enterprising farmer will be determined to increase the value and productive power of his farm, as well as to draw an annual income from it. But if our fields are to be thus improved, and their cultivation is to be systematically carried on, much more yet remains to be done in regard to the preparation and use of manures.

It may be well for us to look at the amount of the loss occasioned by our carelessness and inattention in relation to this matter. It is estimated that at least seventy-five per cent. more manure might be made in the State than there now is, if reasonable care were taken. In many localities there might be an increase of one hundred per cent. without any difficulty, and in a few it might be three or four times that amount.

A few brief extracts from the many letters received by me will serve to show the feeling in different sections of the Commonwealth, on this subject, and the degree of attention paid to it. A correspondent in the western part of Worcester County, says, that the manure in most common use there, is "barn manure and compost, in about equal quantities, spread in spring

for corn and root crops, and covered with a plough, harrow, or cultivator. Much attention is paid to composting by most farmers. Farmers differ somewhat in regard to the most profitable manner of doing it. But few men among us would think of building a barn without a cellar of some sort. The way most practised at present, is to cart loam or muck into the cellar in the fall, and fork it over with the manure from the cattle made during winter, before using in spring. Few of the farmers, (myself among them,) have adopted a new plan of saving manure—that is, dig a cellar about four or five feet deep, put up stanchions from the bottom of the cellar to the scaffold floor, about four feet apart, (tie with chains,) then fill the cellar within three feet of the barn floor with loam or muck, which will enable any full grown animal to eat with ease and convenience from the floor, arranged in such manner as to prevent the wasting of hay. The manure is forked back from the animal every morning for a week or so, and littered with cut straw or hay, leaves, brakes, saw-dust, shavings, &c. &c., then forked forward under the animal and covered with litter, raising the animal nearer the floor, until the stable or cellar is filled, which usually takes until the time of using in spring; then carted out and covered with a small plough as fast as spread, to decompose with the earth, and thereby saving a loss that a heap of compost undergoes while in a state of fermentation. The muck in the bottom of the cellar, answers as an absorbent to take up that part of the liquid that is not retained in the litter. Cattle can be kept much cleaner than on a floor without litter, taking no more than is necessary for an absorbent.

"The foregoing is the manner that a few of us practise in making manure, and preparing the ground for the corn crop. Compost is usually preferred for the root crops. Some farmers have top-dressed their mowing lands with the above-mentioned kind of manure, sowing plaster over the same as fast as spread, to prevent evaporation, and are well satisfied with the result. The saturated muck in the bottom of the cellar, if not too strong, (if so mix more muck,) answers all purposes, where compost is usually used. The manure is trodden so hard there is no fermentation until moved, and the cattle lie almost as easy and comfortable as on the ground, the liquid passing into the

litter and muck below, saving all there is. In the manner above described, one hundred per cent. increase may be made."

In the southern part of Berkshire, also, "Mostly barnyard manure is used, which is spread in the usual way. Our farmers are beginning to pay some attention to the subject of composting, but as yet, except in a few cases, but little progress has been made. Swamp muck, yard manure, lime, ashes and leaves, are the principal ingredients used. The increase per cent. in manures which might be made on our farms, is large; for our farmers, as a general thing, are extremely careless in regard to the saving of manure."

And in the northern part of the same county, "Barn manure, plaster, to some extent, and occasionally guano and bone dust. Very little attention is paid to composting. One hundred per cent. increase might be made by care in saving manure."

In the county of Franklin, a correspondent writes:—"Barnyard manures are chiefly used, applied mostly to tillage, and more generally spread on and harrowed in. There has been but little attention paid to composting; not enough to determine what is the most profitable way of doing it.

"I think that, with reasonable care, there might be some fifty per cent. increase of manure by the use of muck, lime, and ashes, &c."

In Norfolk County, "Animal manures are chiefly used; the most of which are applied to ploughed land. Much attention is paid to composting, and the most profitable mode of preparing compost, is probably by mixing muck or soil, with animal manure in a barn cellar, over which a stock of cattle or horses is kept."

In Middlesex, "The farmers depend upon the natural resources of the farm for their fertilizers, such as the droppings of the stalls, collections of the pigsty, coarse grasses, weeds, leaves, &c.; but chiefly, after the droppings of the stalls, that 'Mother of the meal chest,' meadow muck,—the most convenient, cheapest, and best absorbent and fertilizer, all things considered, that can be used to increase the products of our land. It is found in great quantities in the town, and of excellent quality, and is beginning to be properly appreciated. But they avail themselves of such other helps as they can command in

the use of ashes, lime, super-phosphates, salt, saltpetre, guano, &c. The base of their composts is meadow mud; this is dug and exposed to the sun, rains and frost, for several months, and then mingled with the more concentrated manures already mentioned."

Another intelligent and practical farmer writes:—"Barn and compost manures are chiefly used, and mostly applied to the hills—a practice I am not much in favor of, unless we can plough in a large quantity to sustain the ear in its growth. Some of us top-dress our grass land with compost, applied after harvesting. Some of the farmers here bring night manures from the cities and villages, in the cold season, and compost it with mud and other soil, in considerable quantities. Ashes are used on all kinds of soil to advantage. Gypsum is used in the hill for potatoes, some think to advantage; others have a different opinion. Gypsum and lime have proved of very little service, applied to our soil. Mud seems to be the principal ingredient in composting with our stable and privy manures. Leached ashes, clay, and coal dust, are excellent applications for our porous soil. Guano has not reached us yet; the uncertainty of its goodness, ignorance of applying it, and high prices demanded for it, will prove an obstacle to its introduction here, for some time to come. People differ in their theories about composting manure; some of us compost our manures in low places which receive the wash of the barnyard, or the road, and have an idea that the process of composting requires a great deal of humidity, more than what naturally gets into a barn cellar; others compost in barn cellars, and where swine are kept, and this may be the better way."

The same writer says that double the quantity of manure might easily be made.

In the county of Barnstable, also, they use "Barnyard and stable manures, and sea-weed, ploughed in, in the spring, for hoed crops. But little attention paid to composting. One hundred per cent. increase, certainly. I think I should be safe in saying two hundred, by composting sea-weed, muck, and marsh mud; but few farmers but that have one of these substances handy and in abundance; many farmers have all of them."

Another correspondent, in the interior of the State, writes as follows:—

"The manure heap is the farmer's bank, and his interest may increase in proportion to the amount of capital he yearly lays in.

"Not much attention is paid to composting manures. But few make it, except as wash, loam or muck—of which last article, some farmers have an abundance—are, in the fall, carted into the cowyard or hogpen, to receive the droppings from the cattle or the swine during the coming winter and summer, after which it is carted either for top-dressing to grass, or to the field for the corn hill the next season.

"But few farmers among us have as yet made cellars to their barns. This is a great omission; a neglect detrimental to the interest of the farmer, and of course to the whole community.

"Let him who may, speak against the place and the practice, experience has shown to me that the barn cellar is the place to make manure. By proper attention, the farmer may double the quantity of manure, naturally made from his crops, and retain the quality equal to that of green manure which is flung through the window, and suffered to remain exposed to the rain, the sun, and the wind. In the cellar is saved not only the excrement, but the urine, which is absorbed by the material which has been carted into the cellar; all which before being used, should be thoroughly mixed. This may be done in dull or stormy weather. The gases may be retained by an occasional sprinkling of gypsum over the heap, while the better qualities of the heap, which are exposed to the weather, are generally lost in the atmosphere.

"Coarse, or green manures, are generally applied to fields designed for corn. And taking our fields as a whole—having clay subsoil—it is considered better to spread the manure on the surface and plough it in, rather than plough first, then spread and harrow in the manure. Gaseous matter tends upward, and when the manure is buried by the plough, whatever may attempt to escape will be more likely to be received by, and retained in the soil, than if slightly covered by the harrow."

Still further west, from the county of Berkshire, a practical farmer writes as follows:—

"I have been in the practice of making a compost heap, for several years, of about one hundred loads. My mode of making is as follows: to one load of manure use two loads of rich soil and turf. I commence by a layer of two loads of loam and then one of manure, and continue in this manner until I finish my heap. I generally make it in the fall; it would be as well to do it in the spring, if there is time. In the spring, I work it over, put into it one hundred bushels of ashes, a few bushels of salt, and half a ton of plaster, and it is ready for use. It is good for top-dressing on grass land, and for any crop you may wish to cultivate.

"I think that any of our farmers might double the quantity of manure, by collecting vegetable material about the farm, that goes to waste, and the use of muck, turf, and rich soil, keeping the hogyard well replenished, and have the compost heap the place to put every thing that will add to that which is valuable for manure. All compost manures should be well pulverized and mixed."

To close these extracts, and as a fair specimen of a large number of interesting and valuable letters received on this subject, from all parts of the State, I give the following:—

"The manure principally used, is that made by cattle and hogs. Little attention is paid to composting. Some use loam, or muck, in quantities sufficient to prevent waste of the liquid part of the manure; beyond this, some think that the labor of carting is more than the advantage gained.

"I have no doubt that one hundred per cent. might be added to the value of manure, by saving the liquid portion and keeping the whole under cover, preventing, as far as possible, the escape of the gases, by composting with muck, gypsum, or any other matter by which the escape of the ammonia may be arrested. Most of our farmers expose their manure to the weather, when by simply keeping it under cover they would save, at least, one-third of its value."

These extracts, and many others that might be given, if space allowed, show the enormous loss that is sustained, for the want of a little additional care and labor; loss not only to

the farmer, whom it more directly affects, but to the whole community.

There are in the State, more than 75,000 barns, the returns of 1840 showing 63,816, and those of 1850 increasing the number to 74,764: at the same ratio of increase, there would now be not less than 80,000. It is thought that five cords of manure—of 102$\frac{4}{5}$ bushels each—is a small allowance for each of these barns, since in many towns, and in some entire counties, the average is considerably greater. But suppose it to be only five cords—or about seventeen loads of thirty bushels—to each. This manure may be estimated at three dollars a cord. In some counties, from four to six dollars can be obtained for it without difficulty, and that, too, where the purchaser is obliged to haul it to the distance of five or ten miles, as is often the case. But putting the price at only three dollars, and the number of barns at only 75,000, and the number of cords of manure to each, at only five, all of which are thought to be small estimates, the number of cords now made in the State, would be 375,000, which may be valued at $1,125,000. The best judges think that an increase of one hundred per cent. might easily be made, on an average, throughout the State. If this be true, the Commonwealth annually suffers a loss of $1,125,000 at least, by neglect in this single department.

Probably a greater quantity might be made, but I have estimated only that quantity which it is thought by careful observers might be prepared by the great mass of farmers, without any very great expenditure of time and labor, from the resources of the farm itself. This does not include that limited number of farmers who already make, perhaps, nearly as much as possible, without too great cost.

If the loss now sustained every year by the exportation of bones from the State, and by the want of better arrangements for saving the sewerage of cities, and the sweepings of the streets of large towns, were added to the above, the amount would be swollen to upwards of $2,000,000.

Stock.

We have much reason to be gratified by the great improvement which is exhibited in our neat cattle. The condition of the stock first introduced into this State, has already been alluded to. We have seen that for nearly four years the colony at Plymouth was wholly destitute of cattle.

The date of the first importations is known, the color of the animals is known, and the very names of the individual cows have been preserved, so that we have an exact register of every thing relating to them. One, for instance, was black, one was white bellied, another brindle. There is no sufficient evidence that these cattle came from the county of Devon, as some suppose, and it is known to be a fact, that black was the favorite color at that time in the colony, for the reason already given. The supposition loses much of its weight, also, when we remember, that though the prevailing color of stock in the county of Devon was probably red, (though of this there is no sufficient evidence,) yet that no such race or breed as the North Devons then existed. They were built up at a far later day by a system of judicious breeding. The great change which has been effected in English cattle may be said to have been begun by Bakewell, towards the close of the last century. Since then, rapid advances have been made in consequence of the exertions of such men as Colling, the Earl of Leicester, and others.

But, notwithstanding these great improvements abroad, little interest was felt in the subject here till within the last thirty or forty years. Some attempts have been made since then, to improve the stock which had sprung from the animals so early imported, and with some degree of success. Of late years, there is reason to believe, better shelter, better feed, and better care have greatly improved what are sometimes called the "natives," or the "native stock of New England." In addition to this general improvement in management, an infusion of foreign blood has undoubtedly been very beneficial in many cases. While this process has been going on, the number of domestic animals has increased as the resources of the State have developed. In 1840, there were 143,591 cows,

three years old and upwards. In 1850, there were 152,911, an increase of 9,320 in ten years. The oxen four years old and upwards numbered 46,584, in 1840; 49,986, in 1850; making an increase of 3,402 in the same time. The number of steers and heifers one year old and upwards, was about 88,562, in 1840, while in 1850, it was reported to be 76,703; showing a decrease of 11,859. But the number of horses had increased in the ten years from 60,030, to 74,060; or at the rate of 1,403 annually.

These official statistics show, to some extent, the change which has taken place in some parts of the State in regard to breeding or raising stock. The number of steers and heifers under three years old, was 11,859 less in 1850 than in 1840; giving an annual decrease of 1,185, and showing that instead of raising more stock on our farms, to satisfy the wants of our people, we had become more and more dependant on other states.

The number of cattle brought from without the Commonwealth to supply our markets, and to meet the necessities of our farmers, is now very great; far greater, it is thought, than the number raised within our own borders. In many places it is supposed to be cheaper to purchase young stock, than to raise it. The consequence is, that comparatively little attention is paid to the raising of stock in eastern Massachusetts, though on account of the increased price now asked for this stock, there is a perceptible change, even within the last three years, and more attention is now paid to raising it. A farmer of Essex County, writes thus:—"No attention is given to breeding. The farmers buy their heifers at hazard, and their pigs, or shotes in the same way, mostly. One person has a breed of pigs which he has had for eighteen years, and which he much esteems. The first was of unknown origin. Some pork and beef are marketed out of town, but it is supposed that as much is purchased from abroad for the use of the town."

Another, in the eastern part of Worcester County, says:—"No attention to the breeding of stock. There were introduced, a few years ago, the short-horned Durham, and the Holderness. I may add that our farmers, in their purchases, take great pains in the selection of the stock, and are willing to pay liberally.

But little stock is raised in the town—none with the milk farmers."

These extracts show the prevailing practice in the eastern part of the State, and accounts from every town heard from, are to the same effect. As we approach the western part of the State, however, the aspect of the testimony changes, and the prevailing opinion, in that region, is exhibited in the following brief extracts. The first is from an experienced farmer in the central part of Worcester County. He says:—"But little attention has as yet been paid to *blood* in stock. But little stock has been raised here for many years. The farmers have been supplied with stock from Brighton market, and it comes of all sorts, colors, and qualities, as well as a mixture of all bloods. This has caused a deterioration in the quality of stock in this town, which farmers are beginning to open their eyes to, and many, who in former days sold their calves to grace the butcher's stall, now keep their best calves to grace their own stalls."

In the southern part of the same county, also, a correspondent writes thus:—"But little attention has been paid to the rearing of stock, the farmers generally selling their calves, and purchasing from droves. The farmers, however, are turning their attention to the rearing of their own stock, and some fine animals have recently been introduced into the town. Our oxen and cows are of an improved order. Cows will probably yield, on an average, from twelve to fourteen quarts per day, during the summer months, and some will far exceed it."

And in the western part of the county, the report is, "Farmers are improving their stock very much; nearly one hundred per cent. better now, than years ago." And going still farther west into Hampshire County, we find:—"A high degree of attention has been paid to the breeding of neat cattle and sheep. The most esteemed breed of milch cows and working oxen, with us, has been the short-horned Durham, mixed with 'natives.' The Herefords are also coming into note, and are now, so far as tried, much esteemed. The average quantity of our cows, of different breeds, will not (say for nine months) vary much from ten quarts of milk, and ten ounces of butter per day, though there are many animals that will much exceed this esti-

mate. The number of full-blooded animals in our town is not large; but of neat cattle, sufficient to cross with our mixed stock. The number of full-blooded animals is as follows:—Durhams, six; Herefords, two."

In the adjoining county of Franklin:—"The breeding, or raising of stock may, perhaps, be said to be the most important branch of agriculture in this town. Large numbers are raised and sold to drovers, at two and three years old, with a fair amount of oxen and fat cows; and for a few years past, perhaps no branch of farming has paid the farmer better."

Another correspondent in Franklin County writes:—"More attention has been paid to raising neat cattle, than any other branch of farming. I question whether there is a town in the State, that can exhibit a neat stock equal to Shelburne, that is, of their own raising. The breed is a mixture of Durhams with what are called 'the natives.' We have been in the habit of purchasing Durham bulls for twenty-five years, so that our whole stock is from one-half to seven-eighths Durham.

"We have no full-blooded animals, except bulls. Such a breed as we raise we consider the most profitable, both for the dairy and for working oxen. Our best working oxen, in September, at four years old, weigh from 3,500 to 4,000. Some of the best cows give from thirty-five to fifty-five pounds of milk."

Advancing still farther west into the county of Berkshire, we find that:—"Breeding of stock, receives a great deal of attention, so much so that our native stock has been brought up from almost nothing, to a point which reflects honor and great credit upon our breeders. The progress has been slow, but sure, and we now think we can take the premium at any cattle show in our State, for native stock. This result has been brought about by selecting and crossing with the best breeds in our town and vicinity; it is a cross with the short-horn Durham in most cases, but many cross with the Devons. Our short-horn Durham cross is our best, and cannot be surpassed.

"The variety of opinions in regard to which is the best breed of milch cows is so great that I hardly dare to offer an opinion; but as you ask the question, I should say, in my judgment, a cross of the Alderney with our native stock, would be the best. The dairy interest of our town is very large, therefore we

want the best cows for such purposes, and the cross just mentioned, I think, will come the nearest to it. For working oxen, a cross of the Devons with our native stock, is considered the best, they being the most active and docile."

These selections are made not as the only ones which express the opinions contained in them, but because each of them is supposed to be a fair representation of the state of things in the vicinity of the writer.

The prevailing opinions in regard to the respective merits of different breeds of cattle vary so much in different localities, that it is difficult to tell precisely which are most generally esteemed. We have already seen that in the western part of the State the Durhams are the most highly valued for some purposes, while the Devons are better liked for others. Probably the former are more widely distributed in that region than the latter; this, however, may arise from the fact that they are better known and more fully appreciated. It was, also, the opinion of a late celebrated farmer of Plymouth County, that the improved short-horns were the finest cattle in the world, and were to be preferred where good feed was plenty and the climate was not too severe. The Western States, he thought, might answer these conditions, and many whose opinion should have much weight with us, believe the Valley of the Connecticut to be equally well suited to them on account of its rich pastures and its abundant feed.

On the other hand, the Devons are preferred in many other parts of the State. Their beautiful color recommends them everywhere. The number of "full-blooded" animals of this breed in the State is not far from two hundred.

The Ayrshires are highly prized in some sections, while the Alderneys, or Jerseys, are equally esteemed by many on account of the richness of their milk. This breed has not, as yet, been very extensively tried. There are only about seventy-five of full blood in the State, exclusive of calves under six months old. Probably the result will be that different breeds will be selected for special purposes; for working oxen, particularly for the road, the Devons may come into favor; for size and the market, the Durhams may obtain the preference; for milk, or for butter, the Ayrshires, Devons, Jerseys,

or animals of no known breeds may be better liked, each breed being applied to the use for which it is best fitted. Local circumstances will often govern the farmer, and a proper regard to his own interest will lead him to select and raise animals best adapted to his wants.

In the mean time efforts are needed to raise up, from our present stock, as a basis, a race that shall be sufficiently distinct to be called a breed, and shall be adapted especially to the wants of our State and climate. This stock is far better than that with which Bakewell and other distinguished breeders began, and offers great inducements for the application of science and skill.

While labor continues to be so high, it will be for the interest of the farmer to keep a few superior animals, rather than many of a poorer class; and, when a change is made, animals of fine shape and color, other things being equal, will cost no more than those inferior in these respects. In addition to the greater pecuniary profit derived from them, fine animals give a much greater interest to the labors of farming, and are in themselves a source of pride and pleasure to the possessor. The condition of the farmer may often be judged of by the appearance of his stock, and his manner of keeping it. Inferior animals, worn out by labor, and showing the effects of hunger and neglect, lead one to look at the implements of the farm, the buildings and the general mode of management, and even if they do not show the plain signs of mortgages, they will be very likely to lead the beholder to fear that if the meadows are not drained, something else is. It has been said that the man who neglects his animals, and the means of improving them, does not deserve to thrive. It is a sentiment the justice of which we may all admit.

Sheep.

The number of sheep in this Commonwealth in 1840, was 343,390; it decreased at the average rate of 16,396 annually, till, in 1850, it was only 179,428. They are kept principally in the interior and western parts of the State.

The competition of the Western States has, undoubtedly, been one of the most operative causes which have produced the decrease. Large flocks range freely over their vast prairies,

and the wool can be thrown into our markets at a cost of about one cent per pound. With such competitors, our wool-growers find it difficult to contend. In other respects, the advantage is rather in our favor. Our provision markets must be supplied from a nearer source, and this will probably make it profitable for us to pay more attention to the raising of sheep. Many localities in the western part of the State are admirably adapted to this branch of husbandry. It would probably be for the interest of many farmers, even in the eastern portions, to engage in this business. Mutton and lamb will, doubtless, long continue to command a ready sale in the neighborhood of Boston. The price, when compared with the cost of raising, is such that they can be made profitable, particularly if those breeds be selected which fatten easily. My own experience, in the State of Maine, though limited to three years, was enough to convince me that a few sheep would be an efficient means of renovating the worn-out pastures of eastern Massachusetts. They eat off and destroy the bushes, white-weed and wood-waxen, and soon bring in a thick mat of white clover and other sweet grasses.

It is thought by some that sheep may be pastured with cows, and that a number of the former equal to the number of the latter, which the pasture will support, may be kept there without injury. This was the opinion of some, in whose judgment the farming community have placed great confidence. Inquiries have been made by letter, in different parts of the State, to ascertain the opinion of men experienced in sheep husbandry on this point. The following remarks of a practical farmer and wool-grower, in the western part of the State, well express the opinions which seem to be entertained by all heard from:—

"Sheep, as well as all other animals, have a relish for the sweetest and most fattening productions of the earth, and no animal that the farmer keeps has a greater dislike to coarse, rank grass, than the sheep; consequently they run over and tread down, in search for the best and sweetest food, good, healthy grasses, that cows or neat stock would eat freely and do well on. This, however, is not all; sheep are a strong-scented animal, and wherever they huddle for any length of time, cattle will not readily feed; therefore, I think they never should be allowed to run together."

The breeds of sheep most esteemed in the State, seem to be those which have more or less of Merino blood in them. The Merinos of Spain, so celebrated for their beauty and the fineness of their wool, have been known and valued for ages. Bucks of this breed were sometimes purchased in Spain at the rate of a talent ($1,200) a piece, by the ancient Greeks, nearly twenty-five centuries ago. They were first imported into the United States in 1802, three or four having been obtained by Chancellor Livingston, then Minister to France. These had belonged to the celebrated Rambouillet flock, which Louis XVI. had obtained as a favor of Charles IV. in 1786. A short time before, Gen. Humphreys, Minister to Spain from 1797 to 1801, had purchased two hundred Merinos, had them sent through Portugal, and shipped to this country. At that time, as has been intimated in another connection, but little interest was felt in the improvement of our stock, and these animals attracted no notice for some years. In 1808, however, the embargo led many to turn their attention to wool-growing, and fine wool soon rose to the high price of $1.50 and $2 a pound. In 1809–10 no less than 3,650 Merinos were imported, and these were distributed throughout the United States. The importance of these early importations can hardly be overestimated. They furnished our woollen manufactories with the raw material at times when it would have been expensive and almost impossible to obtain it abroad.

To show, in some degree, how extensively the different breeds have spread through the western part of the State, and how important an interest sheep husbandry has become in that region, I give a few extracts from letters received from men engaged in it.

A farmer of Berkshire County writes as follows:—

"Merino sheep that will shear from three to three and a half pounds of wool, worth, the present year, about fifty-three cents, are mostly kept. While some keep mixtures of Leicester, South Down and Cotswold, selling the lambs for mutton, others keep good weighty Merino ewes, and let them run with coarse bucks, selling the lambs in July or August, at some $2 per head, and the ewes shearing some $1.50 worth of wool; the wool paying the year's keeping of ewes, leaving the lambs to

profit account. Mutton lambs find a quick sale, and I think the latter method the most profitable. The lambs are only kept while the feed is the best and most plenty, leaving the ewes to get fleshy for winter. I sold my lambs the present season, the first of August, from Merino ewes and coarse bucks, at $2.25, and wool at fifty-two cents, sheep averaging about three pounds of wool. Lambs were dropped early in April. Common flocks of sheep are worth about $2 per head, and good lots of ewes $3."

Another, writing from the same county, says:—

"Large quantities of sheep are raised. The majority of our flocks consist of the Merino, Saxon, and a mixture of the English, consisting of South Downs, Leicesters and Cotswolds. Some Spanish Merinos have lately been introduced, which are celebrated for their great weight of fleece. This year sheep are very high, but the average price for them is from $1.75 to $2.50."

In Hampshire County, a correspondent writes thus:—

"The principal breed of sheep is Spanish, with a mixture of Saxon, growing fine wool, worth, at clipping, this season, from fifty-five to sixty-five cents, yielding fleeces of from three and a half to four and a half pounds. Some entire flocks of fine wool yield an average of four and a half pounds well washed wool. Some flocks have been recently much improved by an imported Silesian buck of uncommon fineness and evenness of staple over the entire body, and the result of crossing has, with the same keeping, raised the amount of wool at the first shearing of the half bloods, one pound per head of dry wool over the average of the flock from which they were bred, the old flock averaging four and a half pounds, and the half-bloods five and a half pounds, with increased fineness of fleece. The average value of our sheep at this season of the year is about $3.

From Hampshire County, we have the following:—

"The principal breeds of sheep are the Merino, the Leicestershire, the South Down and Bakewell. When it was an object to raise *wool* for the market, the Merino was the most profitable. But as *mutton* is the object now, I think the South Down the most profitable; they are sheep that give a great quantity of milk; their meat is considered very fine; they frequently have two

lambs, and always get fit for market; average price from $2 to $3 per head."

Many other extracts might be given, from letters coming from Western Massachusetts, but enough has been said to show the general interest felt there in this subject. It is to be hoped that farmers in the eastern counties will try the raising of sheep to some extent, at least. They will find that fine mutton is profitable, even if fine wool is not.

The South Downs seem to have the preference with those who raise only for the market, and some very fine specimens of this breed are to be found in the eastern counties. The French Merinos have recently been introduced into other sections, and though they have not yet been long enough tried to make it possible to estimate precisely their comparative value, they have already received no small share of attention.

Swine.

Probably no one of our domestic animals has been more improved than the swine. Importations have been many and frequent, and either pure bloods or grades of the different breeds are widely distributed in every county in the State. The number of these animals has considerably decreased however, if official statistics are to be relied on; for we find that in 1840, there were 90,335, while in 1850, only 73,041 were reported, showing a decrease in the ten years, of 17,294. There has probably been a great increase since 1850.

This animal comes to maturity in so much less time than the horse or the cow, that any breed supposed to be better than others, soon becomes widely known, and is appreciated as it deserves. There are, indeed, few animals so susceptible of change and improvement in the hands of the breeder, partly for the reason named, and partly because it easily and quickly adapts itself to the circumstances in which it is placed.

The hog was brought here by the early settlers, and was one of the most profitable animals they could have. Its power and habit of providing for itself, when left to range freely, as it was at that time, with little care on the part of the owner, made it an object of special regard with them. No particular attention was paid to breeding, however, till towards

the end of the last century, though some new breeds grew up in various ways. Thus a vessel sometimes arrived from the East, from Europe, or China, having on board one or two animals which had not been used during the voyage. These being brought on shore, sometimes introduced a new breed and sometimes modified the old ones. The Byfield breed was made in this manner by a cross with the Chinese, one of which was thus accidentally brought into the country.

The varieties now most esteemed in the State, are nearly as various as the sections heard from and visited. A few extracts from the letters received on this subject, will, to some extent, serve to show what breeds are preferred, and how far it is thought that pork can be raised with profit.

A correspondent in Franklin County, says:—"Our swine, like all our other stock, are a mixture of breeds, of Berkshire, Woburn and Suffolk. It is difficult to tell which prevails most; they however, altogether, make an excellent breed. We make very little pork to sell. Most farmers kill their pigs at nine and ten months old, which weigh from 250 to 400 pounds per head. This is considered more profitable than to keep longer. A small amount of pork can be raised on every farm with profit; beyond that, it does not pay the expense."

A correspondent in the southern part of Berkshire County, says:—"Our farmers have a breed which for beauty of form weight of pork and profit, cannot be surpassed. Pigs weighing fifty pounds, are worth from four to six dollars. The large number of dairies in our town, render the raising of pork one great source of profit to our farmers."

Another, in the southern part of the same county, says:—"The Suffolk swine are highly esteemed; but on trial, the full blood prove too small for profit. A cross of the Suffolk with the Bedford half-and-half bloods, make the most profitable swine that has ever been kept in this town. And from this breed, it is estimated that a handsome profit may be realized from the raising of pork. I think the above breed, at least, thirty-three per cent. more profitable than the ordinary kinds of swine."

In Worcester County, a practical farmer writes:—"The breed of swine in town, most esteemed, is what is called a

mixture of Suffolk and Mackey; but our breed is so various, that it is difficult to determine what blood prevails.

"It is believed that pork can be raised at a profit of, at least, ten per cent. on the outlay. This belief is founded upon experiments I have made, which have satisfied me that four pounds of corn will make one pound of pork. Corn grown in this neighborhood, will weigh sixty pounds the bushel, and one bushel will make fifteen pounds of pork, beginning with a pig at birth. The average price of corn for the last ten years, is eighty-five cents a bushel. Twenty bushels, or 1,200 pounds, will make 300 pounds of pork, the average price of which, for the last ten years, has been 6¼ cents the pound. Taking these premises, the account will stand thus:—

A pig at birth worth		$0 50
20 bushels of corn, at 85 cents, . . .		17 00
The time taken to consume the corn, and for the hog to grow to 300 pounds weight, dressed, would be from eight to ten months, say ten months; the average time on which to charge interest on the $17 50 cents outlay, would be five months, which at six per cent. would be		44
Whole cost of hog		$17 94
300 pounds of pork, at 6¼ cents, .	$19 50	
Rough fat and pluck worth . . .	50	
Whole proceeds, ...		20 00
Leaving a profit of		$2 06

Or more than eleven per cent. on the outlay, without taking into the account the manure, which will pay, at least, one dollar more than the cost of attendance."

Another, in Norfolk County, writes thus:—"The Suffolk are esteemed, but being tender to rear when young, are not much kept. The Mackeys are approved by some. Many are aware of a very wide difference in profit between the best breed and the poorest, yet are not fully decided as to which of the highly valued breeds will prove the most profitable after a thorough trial.

"By taking into the account the value of the manure that may be made for the farm, it appears to be the opinion of some who have given attention to the subject, that it can usually be raised with a small profit."

In the county of Middlesex, a farmer writes as follows:— "We have the native, Suffolk, and Middlesex crosses, and a few fine Suffolks. An equal blood of the Suffolk and native, is considered the best. This gives the fine points desirable, with more hardiness than the pure Suffolk has. Swine have been greatly improved here within a few years,—and as much in consequence of better attention, as in an improved breed."

From these extracts we see that the Suffolk, or rather a cross of the Suffolk with some other breed, holds the highest place in public estimation in all parts of the State, for practical purposes on the farm. The farmer is well aware that the pork of hogs of a medium size, and younger than formerly, will command a higher price in the market. He begins to consult the prevailing taste and fashion when he raises for the market. He will select, therefore, animals that come to maturity early, in preference to those which will not do for the market till a more advanced age.

Poultry.

The raising of poultry has received no small share of attention by many farmers in the State, and in many cases with much profit. With proper care in furnishing shelter and room in winter sufficiently warm, light and dry, and furnished with food and fresh water, hens will ordinarily continue to lay and grow fat.

The sale of poultry in the metropolis alone, often amounts, it is said, to more than a million of dollars a year. The demand increases, and the market is always ready. By proper management, too, they may be made of great service in destroying the noxious insects which infest the crops. This subject would seem to commend itself to the careful consideration of the farmer.

To show what profit may be found in the judicious management of fowls, the following statement of a practical farmer in Norfolk County, may be given:—"There can be a profit of

seventy-five per cent. realized on native fowls. Poultry and eggs, pork, and Indian corn are among the best, if not the very best products of the farm. Poultry needs more extended remarks. In the first place, select natives, crossed slightly with the imported game; let your chickens be hatched in the month of May, feed with dough made of Indian meal, till large enough to eat corn whole, then feed entirely on corn the remainder of the year. Select your best chickens to keep, the remainder dispose of early. Keep your fowls laying for the remainder of the year and it will be found profitable."

Farm Labor.

An effort has been made to ascertain the relative proportion of native and foreign laborers upon the farms of this State. The customs vary so much in different sections that it is difficult to arrive at an accurate estimate. A large majority of the returns made during the past season, show that intelligent labor, throughout the State, is not only greatly preferred, but commands a higher price than ignorant labor; that an ability to work with the head as well as the hand, is appreciated and sought for.

No better idea of the practices in the different sections can be given, than by the extracts which follow. It will be seen that in the eastern part of the State, foreign hired labor is most common, and that it is employed to a limited extent, in the western. An intelligent farmer of Berkshire says:—"But few farmers employ foreigners. I know of but one employed in that business, they mostly preferring manufacturing places. The native youngsters are preferred, and have obtained the past season from $13 to $16 per month. At least two dollars per month less, is what the foreigner has obtained."

Another, in the same county, says:—"More native than foreign labor is employed, at prices varying from $8 to $12 per month."

In a few towns of that county, however, more especially in the central part, foreign labor is more common. One writes thus:—"Of hired labor, three-fourths are foreigners, at an average price of $13 per month, for six months; $1 per day for haying, or, $150 for the year. Natives command $1.25 per day

for haying, $17 per month, for six months, or $175, or over, for the year. I do not think foreigners are worked to as good advantage on our rough land as on smoother. They are, invariably bad ox-teamsters; but we are forced to employ them, or none. Household labor, almost exclusively foreign. Price paid, $1.25 per week, on an average."

In the western part of Franklin County, it is said:—"We have no foreign laborers on our farms. Native labor averages about $12 per month."

Another statement in the same county, says:—"Good laborers, whether native or foreign, get from $15 to $20 per month. Perhaps, one-ninth are foreign."

The average of the four western counties of Berkshire, Hampshire, Franklin, and Hampden, is found to be less than one-fifth, and those are mostly Irish and French.

The central towns employ a larger proportion of foreigners on farms; yet, in many of the towns, more remote from the large centres of population, it will be found that all the hired labor is native.

In the eastern part of the State, on the other hand, by far the larger proportion of hired farm laborers are foreign. It is thought, that throughout the counties of Norfolk, Middlesex, and Essex, more than three-fourths are foreign. In this respect, there has been a great change within the last few years. Ten or fifteen years ago, the hired labor in eastern Massachusetts was obtained from New Hampshire, Maine, and Nova Scotia; while within the last five years, comparatively few from those places have presented themselves for hire.

In the county of Bristol, it is said:—"But few foreign laborers are employed on our farms. Common laborers, (Americans,) receive from $12 to $18 per month, and found, for six or eight months in the year. The price of farm labor, per day, is about 75 cents and boarded, with the exception of haying, when the price is from $1 to $1.50 per day and found."

The same may be said of a large part of the county of Barnstable, the proportion of native hired laborers being large.

It is evident from what has been said, that the number of foreign hired farm laborers is increasing in all parts of the State, and in some sections, more rapidly than in others.

Profits of Farming.

After the examination we have been engaged in, of the various sources from which the farmer is to draw his profits, it may not be inappropriate to consider what these profits are, and how they are to be increased. It is a significant fact, that in a large portion of the State, the value of farm land, as such, is either positively decreasing, or remains just what it was some years ago. From Worcester County, we have the following statement:—

"By increase of population, land has generally rather increased in value, especially for building lots; but for farming purposes it is not considered any more valuable now than ten or fifteen years ago, and not so valuable as it was fifty years ago. One reason for that is, we could then hire a good man to labor for a single day for half a bushel of corn; now the man will require a bushel and a half for the same labor. Corn then was worth one dollar per bushel with us, and is worth no more now."

This opinion is somewhat qualified, and probably with justice, in a communication from another part of the same county, as follows:—"The value of farm land to sell, has decreased for the last ten years; but for cultivation it has increased, the business of farming paying a larger profit now than ten years ago."

The decrease in the estimated value of farm land, is not confined to the interior of the Commonwealth, but is equally great in many parts of Essex County, situated, as it is, in the immediate neighborhood of the best markets in the world.

In many towns in the Commonwealth, it is thought by some, that the profits of farming do not amount to more than one or two per cent. on the value of the land and stock. In other cases, they are much higher. The average in the State, as shown by the returns, is a little over four and a half per cent.

There must be some cause for this singular difference in profit, and for the low average. If agricultural investments are not remunerative now, when every thing which the farmer brings to market commands a ready and high price, it seems hardly possible that they ever can be under the present man-

agement. It is true that labor is high, but it is no higher in proportion, than nearly every product of the farm.

The true view seems to be, that in this occupation, as in every other, the profit varies with the industry and judgment of the individual engaged in it. Accordingly, we find that well-managed farms pay much more than the average given above. As good management becomes more common, this average will rise. But so long as the exhausting system is pursued, so long will our farm lands continue to diminish in value, till at last they will not pay even the labor devoted to their culture. This is the point to which attention should especially be directed, for though labor may be high, and the farmer may thus be exposed to some disadvantages, a course of proper cultivation would increase the present yield of his land, while it would effect a permanent improvement in its character, and he would thus make a double gain. Our best policy is to manage our land so as to obtain a good crop from it each year, and at the same time to leave it in better condition at the end of the year, than it was at the beginning. The possibility of doing this by liberal treatment, and a judicious rotation of crops, has been so often proved by experiment, that it cannot now be doubted. That it is not now generally done, is every where admitted. If, therefore, the farmer would increase his profits, let him see to it that he is constantly increasing the intrinsic value of his land for farming purposes.

The opinion I have expressed as to the good effects of proper management, is well supported by the judgment of a practical farmer of Worcester County, whose long experience and extensive observation entitle his opinion to great weight. In answer to the eleventh question of the circular as given above, he says:

"Ten per cent. after paying all expenses and labor. My opinion of the profits of farming is based upon my own experience, which I exemplify by the following statement: A farm in my vicinity, of one hundred acres, will cost three thousand five hundred dollars, including buildings; stock and tools, five hundred dollars; in all, four thousand dollars. Such a farm should be divided into sixty acres pasture, twenty mowing, ten tillage, and ten woodland. The woodland, by its growth, will supply

the farm fire indefinitely. The pasture will keep eight cows, two oxen, one horse, and nine young cattle—say, three yearlings, three two-year olds, and three calves. Three heifers, two and a half years old, may be sold every autumn, for beef, at $90. One yoke of oxen will do the work of the farm and gain twenty-five dollars, and be sold for beef each year. Eight cows will produce eighteen pounds of milk, daily, for two hundred and forty days; in all, thirty-four thousand five hundred and sixty pounds of milk, which will make, at twenty-four pounds of milk to one pound of better, one thousand four hundred and forty pounds of butter; which, at 20 cents per pound, is $288. The skim-milk—twenty-four pounds of which will make one pound of pork—will make in pork, one thousand four hundred and forty, pounds, which, at 6½ cents, the average price for the last ten years, is $93.60. Three calves may be raised, and five sold at $7; $35. Three three-year old heifers in calf, or for beef, may be sold annually, $90. Four acres of Indian corn, two hundred bushels, or twelve hundred pounds, will make three hundred pounds of pork, allowing four pounds of corn to make one pound of pork, at 6½ cents per pound, is $195. Three acres of wheat, sixty bushels, at $1.50 per bushel, $90. Three acres of potatoes, three hundred bushels, about the average crop for the last ten years, and 50 cents the average price, $150. Fowls, $20. Profit on oxen, $25. Fruit, $50. Whole amount produce of farm, $1,036.60.

One man and one woman, will do the work of this farm.

Cost of man, including board, $26 a month, .	$312 00
Cost of woman one year, including board $2.50 a week, ...	130 00
Taxes, blacksmithing, wear of tools, &c., . .	50 00
Whole expense, ...	$492 00
Leaving a balance for interest on $4,000, . .	544 60

Outlay of $544.60, or more than 13½ per cent.

"The crops being all consumed on the farm, the land will be kept good. I have pursued for thirty years a similar course to this, except I have raised stock instead of keeping dairy cows; the grain and grass crops being all consumed upon the farm,

the land is now in better condition than when I commenced. The reason for the deterioration of our lands is, that we sell hay, grain and milk; if we do this, we must buy manure; but if we consume our hay and grain on the farm, and make our milk into butter and cheese, and sell this with the beef and pork that our hay, grain, grass and milk will make, our farms will be kept good, the atmosphere furnishing to the land food for vegetation equal to the loss by this course of farming.

"In the estimate above, I have adopted this course of cropping, because it is the one generally pursued by farmers in this neighborhood; but if roots were substituted for wheat, the profits would probably be one hundred dollars more, annually; besides, the additional manure furnished by the roots, would add, in a few years, half a ton an acre, annually, to the hay crop."

The same conclusion may be drawn from the estimates of the comparative expenses and profits of the different crops, often made by intelligent, practical men, fully capable of forming and stating a correct conclusion.

Compare with the above reliable statement, the following account of the effects of a different system in one of the most important towns of Norfolk County, within twelve or fifteen miles of the market of the metropolis:—

"From the above statement of facts, you will see, Sir, that the profits of farming are very small; very many of the farmers say that they are not over one per cent., but I have ventured to say as high as two or three,—perhaps my estimate is too high. The selling of milk, has been, and perhaps is now, the source of the greatest income to the farmer; but the high price at which labor now is, and hay and grain, will make it almost ruinous for the farmer to continue to sell at the old price; during the past year it has been money out of pocket on our farm; but still, we must keep cows, if we have a farm, for the manure; and if we have milk we must sell it at some rate.

"In the State of Ohio, milk sells at the same price that it does with us, and the cost of raising it there is probably not one-half what it is here. In the State of Illinois, it sells for

only one cent less per quart, than our price, but the cost of raising is not one-quarter of what it costs us."

It is estimated that the net income from the farms of Essex County, does not average more than one hundred dollars each, annually. Here, also, it is generally admitted that bad management is the cause of the difficulty, and in many towns in the county where the land is properly cultivated, farmers have realized an honorable competency.

The facts which have been presented, and the reflections suggested by them, seem to furnish a satisfactory answer to the objection so frequently urged against farming,—that it is not profitable,—and it must be conceded, I think, that the skilful farmer is as likely to receive an adequate return for his labor, as any other member of the community. It should be remembered, also, that want of management and skill in any other calling, mechanical or commercial, subjects the individual concerned, to disappointment and failure.

These are some of the points on which inquiries have been made, not as embracing all that was desired, but being as extended as circumstances made it practicable.

It seems proper, in this connection, to make some reference to the "Farmers' Clubs," which have already been established in some parts of the State. Probably they will do more to satisfy the wants of the thinking minds, which now form a large class in our community, than any thing else which can be devised.

About twenty of these clubs have been organized in different towns in the Commonwealth, and the results of their past exertions show that much may be expected from their future labors. By their efforts, a greater interest in agricultural pursuits, and a more earnest spirit of emulation and enterprise has been aroused, and much useful information has been diffused in their neighborhood. In most of the towns where they exist, the inquiries made in the circular given above, were made a subject of discussion, and committees were appointed to gather reliable statistics, which were submitted to the club. From these statistics were drawn up the answers sent to the Secretary, and thus the most active minds of the whole town were engaged

in the preparation of the replies. Returns thus carefully and deliberately prepared, are entitled to as much confidence as if they had been official.

If there were such a club in every town, composed of enterprising and intelligent men, fully conscious of the wants and deficiencies by which progress in their occupation is impeded, some system might be arranged by which the most valuable agricultural statistics from the different parts of the State could be laid before the Board every year, digested and distributed for the use of all who would be benefited by them. Such information is of the utmost importance, if we desire to direct our industry into the most profitable channels. Probably, if there were a general law, authorizing the incorporation of such clubs, under certain conditions, with the right to hold a limited amount of property, and to draw a small sum from the treasury after an equal sum had been raised by the club, the income to be applied to the procuring of such books and such other facilities for gaining information as should be found desirable, a much larger number of these clubs would be instituted. All reasonable requisitions on the part of the Commonwealth, in regard to returns, would gladly be complied with. Thus we might secure the annual return of all the statistics that are now obtained only at long intervals, and many more besides. In this way we might bring to the minds of many, important facts which cannot now be obtained.

A library of suitable agricultural works, accessible to all, would, of itself, be of inestimable value to the young. The slightest circumstance often gives a decided turn to the character and whole life of an individual. Elevate farming as a pursuit—render it attractive by bringing mind to bear upon its labors, and making it something more than the exertion of mere brute physical force—and fewer complaints will be heard from those who follow it. Then the attention of young men will be turned to its advantages, and the aversion they now feel will be succeeded by a love for it. The mind of youth is ever active, inquiring, and fond of investigation. If its energies are directed into proper channels, they work for the prosperity of the State; if not, the individual and the community must alike suffer for the neglect.

But, apart from any considerations of advantage to the State, such associations promote the highest social feelings. The farmer is necessarily more or less isolated. His pursuits do not bring those engaged in them into contact with other men, as many other occupations do. This remark applies with especial force to the smaller and less populous towns where the facilities for social improvement, by means of libraries, lectures, and constant contact of mind with mind, are comparatively few. The establishment of Farmers' Clubs, therefore, would be doubly advantageous; it would benefit the State by securing accurate agricultural statistics, and the town or neighborhood, by giving opportunities of social intercourse and mental cultivation to those who would gladly profit by them.

When the club is once established, and a foundation is laid for a valuable library, it will grow rapidly; and though there may, at first, be but few leading minds sufficiently interested to work for its success, they will soon be found, and vigor and enthusiasm will be shown in every discussion entered into by the club. When the mind is once deeply interested in any subject, it often exerts powers it was not itself conscious of possessing before, and experience of the good effects of Farmers' Clubs will show with how much advantage this principle may be applied to agricultural investigations.

These considerations, I think, justify the conclusion that the importance of such associations can hardly be over-estimated.

The committee of a Farmers' Club speak of these associations as follows:—

"In conclusion, allow us to call your attention to the means which, in our opinion, after a practical test of four years, will be found more efficient than any other for elevating the condition of the farmers of Massachusetts. We allude to the formation of Farmers' Clubs, or town associations. The distinguishing feature of such organizations is the social meetings for the discussion of subjects connected with agriculture. The great mass of the working farmers of Massachusetts are comparatively ignorant men, and one trait is common to very ignorant and very learned men, viz.: a strong attachment to certain theories or hobbies, which stand ever in the way of impartial investigation; and we think that no plan can be devised which so

effectually roots out error, as bringing these different theories —formed, as they usually are, upon a very limited observation of facts—into collision with each other by means of free and friendly discussion. We have no hesitation in saying that the result of such discussions among ourselves has been to diffuse more valuable information through our community than could possibly have been accomplished in twice the time, if every farmer among us had carefully read every scientific work ever published upon agriculture. It is a great mistake to suppose that the formation of such associations will injure those of the several counties in the State, and we would do all in our power to remove the antagonistic feeling which has in some degree existed between the two forms of organization. That they must benefit the county societies is, we think, rendered evident by the increased interest in that of Middlesex County, where these town societies have for some years been most extensive."

Some allusion should also be made to the county agricultural societies, and the manner of awarding prizes in different sections of the State. These societies are, without doubt, doing a great and good work for the agriculture of this Commonwealth. Few things, however, are more difficult, than to arrange a system of awarding prizes, which is perfect in all its practical details. There is, therefore, need of much forbearance on the part of individuals, and great discrimination and care on the part of committees; and even then, there will be cases in which more or less dissatisfaction and ill-feeling is excited. For instance, an honest difference of opinion often arises between the owner of an animal entered for premium and the members of the committee, or between the members of the committee themselves. Very few, comparatively, have made the points of perfection in an animal a matter of special and careful study. Most men form an opinion from the impression received at a first view, without examining in detail the degree in which the animal has each of the various points, which, together, would make it perfect. But the same men would admit that the general appearance is often deceptive. Of two cows, for example, standing side by side, one may be beautiful, and, on the whole, well formed, the other ill-shaped and unattractive, yet in those points which constitute a great milker, the latter may

be much superior to the former. The great majority of spectators would, without a moment's hesitation, select the most beautiful as the best, while a careful study of the real points which make a perfect cow, would show their error. Moreover, even where the examiner has a standard by which he tests the animal before him, this standard will of course be different in different individuals, being formed on different degrees of observation and study in each. There is, therefore, a necessity for some general standard, that the grounds of the decision of the committee may be known. The points, or standard, by which the merits of the animals offered are to be judged, being known by all, the committees would have not only a guide for their decision, but also a protection against the unfair criticisms by which they are now too frequently assailed.

It might be well for each society to fix some such standard as could be easily understood, by which its premiums should be awarded. This might be done in the department just alluded to, by fixing upon a certain number of points, with the understanding that the animal in which these are to be found in the highest perfection, shall be entitled to the first premium. A want of a certain number of these points, should exclude the animal from consideration in the distribution of premiums. Such a model in the hands of the committee, giving all the members the same means of comparison, would be a great aid to them, and would make the awarding of premiums comparatively safe, easy and agreeable, instead of being difficult and embarrassing as it now is.*

* The following Points of excellence for the different breeds of stock have been adopted, after careful consideration, by the society of a neighboring State, and are substantially the same as those adopted by the best judges of stock in England, viz.:

POINTS OF A SHORT-HORN COW.

Pedigree—Showing unbroken descent, on both sides, from known animals, derived from English herds, as found in the English or American Herd Books, and without this, an animal cannot compete in this class.

The Head, small lean and bony, tapering to the muzzle, ... 3

The Face somewhat long, the fleshy portion of the *Nose* of a light delicate color, ... 2

The Eye is of great significance, and should be prominent, bright, and clear—"prominent," from an accumulation of "adeps" in the back part of its socket, which indicates a tendency to lay on fat—"bright," as an evidence of a good

Some local questions have arisen in consequence of the incorporation of two or more societies covering the same territorial limits. These give rise to difficulties which were not originally foreseen. To many individuals this subject seemed to be of sufficient importance to call for the consideration of the Board

disposition—"clear," as a guarantee of the animal's health; whereas a dull, sluggish eye belongs to a slow feeder, and a wild, restless eye betrays an unquiet, fitful temper, ... 2

The Horns—light in substance and waxy in color, and symmetrically set on the head; the *Ear* large, thin, with considerable action, ... 1

The Neck—rather short than long, tapering to the head; clean in the throat, and full at its base, thus covering and filling out the points of the shoulders, . 2

The Chest—broad from point to point of the shoulders; deep from the anterior dorsal vertebra to the floor of the sternum, and both round and full just back of the elbows; sometimes designated by the phrase, "thick through the heart." These are unquestionably the most important points in every animal, as constitution must depend on their perfect development, and the ample room thus afforded for the free action of the heart and lungs, ... 14

The Brisket, however deep or projecting, must not be confounded with *capacity* of chest; for though a very attractive and selling point, it, in reality, adds nothing to the space within, however it may increase the girth without. It is in fact nothing more nor less than a muscular adipose substance, attached to the anterior portion of the sternum, or breast-bone, and thence extending itself back. This form, however, of the brisket, indicates a disposition to lay on fat generally throughout the frame, and in this point of view is valuable, . 5

The Shoulder, where weight, as in the Short-horn, is the object, should be somewhat upright and of good width at the points, with the blade-bone just sufficiently curved to blend its upper portion smoothly with the crops, . 4

The Crops must be full and level with the shoulders and back; and is, perhaps, one of the most difficult points to breed right in the Short-horn, . . 8

The Back, Loin and *Hips* should be broad and wide, forming a straight and even line from the neck to the setting on of the tail, the hips or hucks round and well covered, ... 8

The Rumps laid up high, with plenty of flesh on their extremities, . . 5

The Pelvis should be large, indicated by the width of the hips (as already mentioned) and the breadth of the twist, ... 2

The Twist, should be so well filled out in its "seam" as to form nearly an even and wide plain, between the thighs, ... 3

The Quarters—long, straight, and well developed downwards, . . . 5

The Carcass—round; the ribs nearly circular, and extending well back, . 4

The Flanks—deep, wide, and full in proportion to condition, . . . 3

The Leg—short, straight, and standing square with the body, . . . 2

The Plates of the belly, strong, and thus preserving nearly a straight under line, ... 3

The Tail—flat and broad at its root, but fine in its cord, and placed *high up*, and on a level with the rumps, ... 2

The Carriage of an animal gives style and beauty; the walk should be square and the step quick; the head up, ... 2

of Agriculture. After mature deliberation, the Board passed unanimously the following vote, that, "In the opinion of this Board, if it shall be deemed expedient by the Legislature to grant acts of incorporation for agricultural societies within the

Quality—On this the thriftiness, the feeding properties, and the value of the animal depends; and upon the touch of this quality rests, in a good measure, the grazier's and the butcher's judgment. If the "touch" be good, some deficiency of form may be excused; but if it be hard and stiff, nothing can compensate for so unpromising a feature. In raising the skin from the body, between the thumb and finger, it should have a soft, flexible and substantial feel, and when beneath the out-spread hand, it should move easily with it, and under it, as though resting on a soft, elastic, cellular substance; which, however, becomes firmer as the animal "ripens." A thin papery skin is objectionable, more especially in a cold climate, ... 15

The Coat should be thick, short and mossy, with longer hair in winter, fine, soft and glossy in summer, ... 2

The Udder—pliable and thin in its texture, reaching well forward, roomy behind, and the teats stand wide apart, and of convenient size, . . . 3

100

Points of the Short-horn Bull.

As regards the male animal, it is only necessary to remark, that the points desirable in the female are generally so in the male, but must, of course, be attended by that masculine character which is inseparable from a strong, vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get.

In contra-distinction to the cow, the head of the bull may be shorter, the frontal-bone broader, and the occipital flat and stronger, that it may receive and sustain the horn—and this latter may be excused if a little heavy at the base, so its upward form, its quality and color, be right. Neither is the looseness of the skin, attached to, and depending from the under jaw, to be deemed other than a feature of the sex, *provided* it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap.

The upper portion of the neck should be full and *muscular*, for it is an indication of strength, power and constitution. The spine should be strong, the bones of the loin long and broad, and the whole muscular system wide and thoroughly developed over the entire frame.

NORTH DEVONS.

Purity of Blood, as traced back satisfactorily to importations of both dam and sire, from known English breeders, or as found in the lately established Herd Book, for North Devons, and without this, an animal can not compete in this class.

The Head should be small lean and bony; the forehead wide, flat, or from a fullness of the frontal bone over the eyes, somewhat dishing; the face straight; the muzzle fine; the nostrils open; the lips thin and rather flat, . . . 4

The Nose of a light delicate orange color, ... 4

The Eye should be bright, prominent, and clear, but mild and gentle in its

limits of existing societies, the geographical limits of such societies should be distinctly defined, so that no two societies hereafter to be entitled to the bounty of the State shall cover the same territory."

expression, as indicative of that spirited, but tractable disposition so necessary to cattle that must bear the yoke; a beautiful orange-colored ring should invariably surround the eye, ... 4

The Ear—thin: of a rich orange-color within, of medium size, with a quick and ready movement, expressive of attention, ... 2

The Horns—light, tapering, of a waxy color toward the extremity, and gaily as well as symmetrically placed on the head; the occipital bone, narrow, thus bringing the base of the horns nearer together, ... 2

The Neck of medium length, somewhat light in substance, very clean, and well set up on the shoulder, ... 2

The Chest—deep and round, carrying its fullness well back of the elbows, thus affording, by the aid of a springing rib, abundant internal room for the action of the thoracic viscera, the heart and lungs, and that too, without an *extreme* width forward, and between the points of the shoulders, which might interfere with the action of the animal, ... 14

The Brisket—It being assumed that it adds nothing to the internal capacity of the chest, must not overload the breast, but be sufficiently developed to guarantee a feeding property, attended with a full proportion of fatty secretion, ... 4

The Shoulder is, in this breed, a very beautiful and important point, and should in a *degree* approximate in form to that of the horse. It should take a more sloping position than is found in most other breeds, with its points less projecting, and angular, and the blade bone more curved, thus blending with and forming a fine wither, rising a little above the level line of the back, . 4

The Crops full and even, forming a true line with the somewhat rising shoulder, and level back, without either drop or hollow, ... 3

Back, Loin, and *Hips,* broad and wide, running on a level with the setting on of the tail, ... 9

The Rumps—lying broad apart, high, and well covered, ... 5

The Pelvis—wide, ... 2

The Twist—full and broad, ... 3.

The Quarters long and thoroughly filled up between the hooks, or hip bones, and the rumps, with a good muscular development down the thigh to the hocks, ... 6

The Flank—Moderately deep, full and mellow in proportion to condition, . 3

The Legs not too short, and standing as square, and straight behind, as may be compatible with activity. The bone quite small below the hock and knee; the sinews large and clean, with the fore-arm well developed, . . . 5

The Carcass round and straight; its posterior ribs almost circular, extending well back, and springing nearly horizontally from the vertebra, giving, in fact, much greater capacity than would at first appear, ... 2

The Tail, at its junction, level with the back, long, very slender in its cord, and finishing with a tassel of white hair, ... 1

The Color, in its *shades* and *degrees,* is more or less governed by fashion; but

The want of reliable and accurate experiments in agriculture is now very generally felt, and it has been the desire of the Board to have such conveniences as would enable them to conduct a series of experiments in such a manner as to secure

in the Devon is always red. Formerly a rich blood-red was the favorite color, and a test of purity; and now a somewhat lighter color is in vogue, approaching rather nearer to that of the *South* Devon, which is a larger, coarser, stronger animal. In all cases the color grows lighter round the muzzle, while a dark mahogany color, verging almost to a black, and growing yet darker about the head, always was a very questionable color for a *true North Devon*, more especially when accompanied by a dark nose, ... 1

The Hair should be short, thick, and fine; and if showing on its surface a fine curl, or ripple, it looks richer in color, and is supposed to indicate a hardier and more thrifty animal, ... 1

The Udder should be such as will afford the best promise of capacity and product, ... 1

The Carriage—The Devons having, from their excellence in the yoke, another destiny besides that of the butcher's block, it is all important that the animal's carriage should indicate as much; but to obtain this, something of the heavy, inert, squarely moulded frame of the merely beefing animal must be relinquished for a lighter and more active frame, ... 3

Quality—On this the thriftiness, the feeding properties, and the value of the animal depends; and upon the touch of this quality rests, in a good measure, the grazier's and the butcher's judgment. If the "touch" be good, some deficiency of form may be excused; but if it be hard and stiff, nothing can compensate for so unpromising a feature. In raising the skin from the body, between the thumb and the finger, it should have a soft, flexible and substantial feel, and when beneath the out-spread hand, it should move easily with it, and under it as though resting on a soft, elastic, cellular substance; which, however, becomes firmer as the animal "ripens." A thin papery skin is objectionable, more especially in a cold climate, ... 15

100

Points of the Devon Bull.

As regards the male animal, it is only necessary to remark, that the points desirable in the female are generally so in the male, but must, of course, be attended by that masculine character which is inseparable from a strong, vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get.

In contra-distinction to the cows, the head of the bull may be shorter, the frontal-bone broader, and the occipital flat and stronger, that it may receive and sustain the horn—and this latter may be excused if a little heavy at the base, so its upward form, its quality and color, be right. Neither is the looseness of the skin, attached to, and depending from the under jaw, to be deemed other than a feature of the sex, *provided* it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap.

The upper portion of the neck should be full and *muscular*, for it is an indication

the confidence of the community. Those made by individuals in various parts of the State have been very valuable to the experimenters, and in some cases very costly, but as long as there is no concert of action, our ignorance and confusion of

of strength, power and constitution. The spine should be strong, the bones of the loin, long and broad, and the whole muscular system wide and thoroughly developed over the entire frame.

HEREFORDS.

Purity of Blood, as traced back to the satisfaction of committees, to imported blood, *on both sides,* from some known English breeder, or as found in Eyton's Hereford Herd Book.

The Head—moderately small, with a good width of forehead, tapering to the muzzle; the cheek-bone rather deep, but clean in the jaw, ... 3

The Nose, light in its color, and the whole head free from fleshiness, . . 2

The Eye full, mild, and cheerful in its expression, ... 2

The Ear of medium size, ... 1

The Horns—light and tapering, long and spreading, with an outward and upward turn, giving a gay and lofty expression to the whole head, . . 2

The Neck—of a medium length; full in its junction with the shoulders, spreading well over the shoulder points and tapering finely to the head, . 2

The Chest—broad, round, and deep; its floor running well back of the elbows, which, with a springing fore-rib, gives great interior capacity to this all important portion of the body, ... 14

The Brisket—when in flesh, largely developed, descending low between the legs, and deep, by covering the anterior portion of the sternum, or breast bone, but never interfering with the action of the animal when in working condition, 4

The Shoulder—lying snugly and closely in towards the top and spreading towards the points; the blade sloping somewhat back, and running pretty well up into the withers, which by rising a very trifle above the level line of the back, gives to the ox a very upstanding, and beautiful fore-end. The whole shoulder well clothed with muscle, ... 3

The Crops—filling all up evenly behind the shoulders, and blending them smoothly with the muscles of the back, ... 3

The Back, loin and hips, should be broad, wide and level, . . . 8

The Rumps should lie nearly, or quite level with the back, and their covering should be abundant, mellow, loose, and freely moving under the hand, thus showing great aptitude to fatten, ... 4

The Pelvis—roomy; indicated by wide hips, as already mentioned, and the space between the rumps, which should stand well apart, giving a general breadth to the posterior portion of the animal, ... 3

The Twist, broad and full, extending well down on each side of the thigh, with corresponding width—a broad twist is a good indication of a butcher's animal, ... 5

The Hind Quarters—large and thoroughly developed in its upper and more valuable portions, as beef. The thigh gradually tapering to the hock but muscular, ... 6

ideas respecting the many questions still remaining to be answered, in agricultural science, will continue. It is often the case that an experiment is tried at the recommendation of some agricultural journal, or some writer, or friend of improvement,

The Carcass—round throughout; full and capacious, with the under line of the belly level, or nearly so, ... 3

The Flank full and wide, ... 3

The Legs—straight, upright; firmly placed to support the superincumbent weight; a strong back sinew, but by no means a large, coarse, cannon bone, . 3

The Plates of the belly strong, and thus preserving nearly a straight under line, ... 3

The Tail—large and full at its point of attachment, but fine in its chord, . 2

The Carriage—prompt, resolute, and cheerful; and in the ox, gay and lively, 3

The Hair—thick, close and furry, and if accompanied with a long growth, and a disposition to curl moderately, is more in estimation, but that which has a harsh and wiry feel is objectionable, ... 3

The Udder should be such as will afford the best promise of capacity and product, ... 2

Color—Reds or rich browns, oftentimes very dark, with a white or "brockled" face, are now the colors, and marking of the Herefords, though gray Herefords or cream-colored, are not uncommon, ... 1

Quality—On this the thriftiness, the feeding properties, and the value of the animal depends; and upon the touch of this quality rests, in a good measure, the grazier's and the butcher's judgment. If the "touch" be good, some deficiency of form may be excused; but if it be hard and stiff, nothing can compensate for so unpromising a feature. In raising the skin from the body, between the thumb and finger, it should have a soft, flexible and substantial feel, and when beneath the out-spread hand, it should move easily with it, and under it, as though resting on a soft, elastic, cellular substance; which, however, becomes firmer as the animal "ripens." A thin papery skin is objectionable, more especially in a cold climate, ... 15

100

Points of the Hereford Bull.

As regards the male animal, it is only necessary to remark, that the points desirable in the female are generally so in the male, but must, of course be attended by that masculine character which is inseparable from a strong, vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get.

In contra-distinction to the cows, the head of the bull may be shorter, the frontal-bone broader, and the occipital flat and stronger, that it may receive and sustain the horn—and this latter may be excused if a little heavy at the base, so its upward form, its quality and color be right. Neither is the looseness of the skin, attached to, and depending from the under jaw, to be deemed other than a feature of the sex, *provided* it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap.

The upper portion of the neck should be full and *muscular*, for it is an indication of strength, power and constitution. The spine should be strong, the bones of the

and when the experimenter finds the result does not answer his expectations, he is ready to cry out, "the old way is best; leave me to follow in the tracks of my fathers." Thus the farmer is often advised to plough deep, and pulverize the soil

loin, long and broad, and the whole muscular system wide and thoroughly developed over the entire frame.

AYRSHIRES.

Purity of Blood, as traced back to importations of both dam and sire, under such evidence as will satisfy committees.

The Head, as in other breeds, small; the face long and narrow; the muzzle and nose variable, ... 4

The Eye placid and not strikingly large, ... 2

The Ear of full size, and of an orange color within, ... 4

The Horns small, tapering, with an outward and upward turn, and set on wide apart; the face somewhat dishing, ... 2

The Neck of medium length, clean in the throat, very light throughout, and tapering to the head, ... 4

The Shoulders lying snugly to the body, thin at their top, small at their points, not long in the blade, nor loaded with muscle, ... 6

The Chest must retain sufficient width and roundness to insure constitution. The lightness of the fore-quarter, and the "wedge shape" of the animal from the hind-quarter forward, arising more from a small, flat and thin shoulder, than from any undue narrowness of the chest, ... 12

The Crops easily blend in with so thin a shoulder, and prevent all hollowness behind, ... 4

The Brisket not over-loading the fore-end, but light, ... 4

The Back should be straight, and the loin wide, the hips rather high and well spread, ... 8

The Pelvis roomy, causing a good breadth at what is termed the "thurl," or "round-bone," and between the points of the rumps, ... 4

The Quarters long, tolerably muscular, and full in their upper portion, but moulding into the thighs below, which should have a degree of flatness, affording thus more space for a full udder. The flank well let down, but not heavy, 6

The Ribs, behind, springing out *very* round and full, affording space for a large udder, which by Ayrshire breeders is considered very essential to secure the milking property; the whole carcass thus acquiring increased volume towards its posterior portion, ... 8

The Rumps nearly level with the back projecting but little, ... 4

The Tail thin in its cord, of full length, light in its hair, and set somewhat farther into the back than would be admissible with some other breeds, . 1

The Legs delicate and fine in the bone, inclining to be short, and well knit together at the joints, ... 3

The Udder in this breed is of more especial importance, as the Ayrshires have been bred almost exclusively with reference to their milking properties. The great feature of the udder should be capacity, without being fleshy. It should be carried squarely and broadly forward, and show itself largely behind. As it rises upward it should not mingle too immediately with the muscle of the

thoroughly. He drives down the plough, throws up the subsoil, and tries it for one season. The piece so treated is then planted, and by its side another, ploughed, perhaps, but five or six inches deep. The latter may bear the better crop, and the

thighs, but continue to preserve its own *peculiar* texture of skin—thin, delicate and ample in its folds. The teats should stand wide apart, and be lengthy, but not large and coarse, ... 12

The Handling will show the skin to be of medium thickness only, moving freely under the hand and evincing a readiness in the animal to take on flesh, when a drain on the constitution is no longer made by the milkpail, . . 6

The Hair soft and thick, in the phraseology of the country, woolly, . . 4

Color, varies—a dark red—a rich brown—a liver color, or mahogany, running into almost a black; those very much broken and spotty at the edges on a white ground are the favorite colors at the present time. The light yellow is, however, a color; sometimes found on very good cows, but these pale colors are objected to from an impression that such belong to animals of less constitution, ... 1

Carriage should be light, active, and even gay; this latter appearance is much promoted by the upward turn of the horn, ... 1

100

Points of the Ayrshire Bull.

As regards the male animal, it is only necessary to remark, that the points desirable in the female are generally so in the male, but must, of course, be attended by that masculine character which is inseparable from a strong, vigorous constitution. Even a certain degree of coarseness is admissible, but then it must be so exclusively of a masculine description as never to be discovered in the females of his get.

In contra-distinction to the cows, the head of the bull may be shorter, the frontal-bone broader, and the occipital flat and stronger, that it may receive and sustain the horn—and this latter may be excused if a little heavy at the base, so its upward form, its quality and color be right. Neither is the looseness of the skin, attached to, and depending from the under jaw, to be deemed other than a feature of the sex, *provided* it is not extended beyond the bone, but leaves the gullet and throat clean and free from dewlap.

The upper portion of the neck should be full and *muscular*, for it is an indication of strength, power and constitution. The spine should be strong, the bones of the loin long and broad, and the whole muscular system wide and thoroughly developed over the entire frame.

For the Jersey, or Alderney cows, the following scale of points has been established by the society in the Island of Jersey.

Scale of Points for Cows and Heifers.

I. Breed on male and female sides, reputed for producing rich and yellow butter, ... 4

II. Head small, fine and tapering; eye full and lively, muzzle fine, and en-

trial is thought to justify the conclusion that it is best to go on and let the subsoil alone.

We are too apt to forget that a single experiment does not settle or unsettle a law of the natural world. If one fails, it

circled with white; horns polished and a little crumpled, tipped with black; ears small, of an orange color within, ... 8

III. Back straight from the withers to the setting on of the tail; chest deep, and nearly on a line with the belly, ... 4

IV. Hide thin, movable, but not too loose, well covered with fine soft hair, 2

V. Barrel-hooped and deep, well-ribbed home, having but little space between the ribs and hips; tail fine, hanging two inches below the hock, . . 4

VI. Fore legs straight and fine, thighs full and long, close together when viewed from behind; hind legs short, bones rather fine; hoof small; hind legs not to cross in walking, ... 2

VII. Udder full, well up behind; teats large and squarely placed, being wide apart; milk veins large and swelling, ... 4

VIII. Growth, ... 1

IX. General appearance, ... 2

Perfection for Cows, ... 30

Two points shall be deducted from the number required for perfection on heifers, as their udder and milk veins cannot be fully developed. A heifer will therefore be considered perfect at twenty-eight points.

No prize will be awarded to cows or heifers having less than twenty-one points.

Scale of Points for Jersey Bulls.

I. Purity of breed on male and female sides, reputed for having produced rich and yellow butter, ... 4

II. Head fine and tapering, cheek small, muzzle fine and encircled with white, nostrils high and open, horns polished, crumpled, not too thick at the base, and tapering, tipped with black; ears small, of an orange color within, eye full and lively, ... 8

III. Neck fine, and lightly placed on the shoulders; chest broad, barrel-hooped and deep, well-ribbed home to the hips, ... 3

IV. Back straight from the withers to the setting on of the tail, at right angles to the tail. Tail fine, hanging two inches below the hock, . . . 3

V. Hide thin and movable, mellow, well covered with soft and fine hair, 3

VI. Fore arm large and powerful, legs short and straight, swelling and full above the knee, and fine below it, ... 2

VII. Hind quarters, from the huckle to the point of the rump, long and well filled up; the legs not to cross behind in walking, ... 2

VIII. Growth, ... 1

IX. General appearance, ... 2

Perfection, ... 28

No prize shall be awarded to a bull having less than twenty points.

But the majority of animals offered for prizes at our exhibitions is of no known breed, and it is a matter of no small difficulty to know on what principle to award

should be carefully repeated, on a small scale, if necessary, and so on till, by a series of careful trials, we obtain something reliable enough to enable us to form a judgment.

We should remember, also, that the results of an experiment made in one locality, or on one kind of soil, will be very different from those of the same experiment under other circumstances. Theories founded on a limited range of observation cannot be expected to be generally applicable.

prizes. It is, however, important that there should be some known standard for these animals, as well as for others.

The following scale of Points is offered with much diffidence, in the hope that it may aid, at least, in forming some system. If societies or committees would adopt some such known standard, to be followed in similar cases, it would be found, it is thought, of essential service :—

Scale of Points for Cows and Heifers for the Dairy.

I. Head small, lean and tapering, eye full, lively and mild, ears small orange within, horns small, ... 5

II. Back straight, from withers to root of the tail. Brisket full, chest deep, and nearly on a line with the belly. (The shoulders sometimes rise loosely above the back bone, many good milkers have this *defect*,) 4

III. Skin moderately thick, but mellow; hair soft to the touch and fine. The skin should incline to yellow, and be soft, ... 3

IV. Barrel-hooped, broad and deep, surloin broad, tail tapering from the rump downwards, ... 4

V. Legs straight, delicate and fine boned, ... 2

VI. Apparent health, ... 2

VII. Udder coming broadly and squarely forward, large and full behind, and rising up the thighs, preserving its distinct character of skin, soft, delicate and loose folds, with teats of medium length, standing well apart, . . . 5

VIII. The escutcheon is represented by the upward growing hair, which commencing on the back side and near the lower part of the udder, and on the inside of the hocks, extends upwards towards the first touch or tip of the rump, and also upwards and outwards to the outer edge of the thigh. The better marks are those which extend farthest out upon the thighs, other things being equal. Accompanying these best marks, there are also two spots or rounds of downward growing hair, one on each side of the udder, near the hinder teats. There are also many other particulars connected with different escutcheons, the comparative value of which can only be understood by a reference to the small treatise upon the subject, by M. Guénon, which is easily accessible to all, in a translation, a second edition of which has been lately published.

As milk is the chief object with most who keep milch cows, the escutcheon which indicates this in the highest degree should be entitled to, ... 5

Points of perfection, ... 30

No animal should obtain a premium which has less than twenty.

The points desirable in the bull are, in the main the same, marked, however, by more masculine character.

This consideration has too often been overlooked, and undeserved discredit has thus been thrown on projects and theories good in themselves, but which have not produced the anticipated effect, merely because they were applied to circumstances and situations to which they were in no way adapted. Because an experiment fails on a soil entirely unlike that where it was first made and succeeded, we should not infer that he who first tried it was ignorant, or gave a false account of his experience; yet this hasty judgment is not uncommon. On the other hand, both writers and experimenters would do well to remember, what they now often forget, that by the confident assertion of theories purporting to be of universal application, they will inevitably lessen their own influence, while they retard the progress of agriculture. The mode of treatment which would be advantageous and profitable in Berkshire, may be expensive and ruinous in Barnstable. The crops and general husbandry best adapted to one situation may be wholly unsuited to another; the ideas of farming, the facilities for obtaining labor, and even the animals, differ in different localities.

It has been thought that if a tract of land sufficiently large, and with such a variety of soils as would make it convenient for carrying on experiments, could be provided, the Board of Agriculture would be able to do something by which these evils might be gradually remedied, and the wants of the farming community supplied. No provision has, as yet, been made to enable the Board to direct special attention to this subject.

Massachusetts was one of the first governments, if not the first, in this country, which attempted to aid the progress of agriculture by legislative enactments. As early as 1630, her bounty began in premiums offered for the raising of horses, cows, swine and goats, for the promotion of agriculture. During the last thirty years, this bounty has been increasing and always liberal. Other States have not been slow to imitate or rival her in generous endeavors to promote the success of an interest on which the prosperity and happiness of their people so largely depend.

No means are at hand showing the comparative encouragement afforded to agriculture by the different States.

The amount paid, or to be paid, from the treasury of this

Commonwealth for the past year, to be distributed in prizes by the various Societies, is no less than $8,782.

The aggregate amount of the permanent fund of the societies is .	$92,816 54
" " " of all the property of the societies is . .	109,911 10
" " " of income of fund, ...	4,325 03
" " " received from new members and donations, .	6,376 50
" " " of receipts by the societies for the year, . .	28,465 82
" " " of premiums and gratuities distributed, .	8,489 11
" " " of disbursements for the year, . . .	21,014 37
Of the premiums distributed, there were paid on farms and various farm improvements, ...	1,574 00
For live stock of all kinds, ...	4,451 37
" farm products of all kinds, ...	2,133 18
The number of persons who received prizes and gratuities was . .	2,095

A more detailed statement of the manner in which these disbursements have been made, will be found in the Appendix to this Report, to which reference is respectfully made.

This bounty, through the premiums of the county societies, unquestionably does much good. But the meetings of a county society must necessarily be rare, and even if they were more frequent, they could hardly do all that is required. Other means of improvement are necessary. It is a very common remark, and one whose truth is generally admitted, that the education most in keeping with the spirit of the age, is that which makes one most competent to perform the duties of his profession. The young man who proposes to engage in any other occupation which demands the exercise of any degree of scientific knowledge, devotes some of the best years of his life to a laborious preparation. In all the different departments, except that of agriculture, ample facilities are found for the professional education of the young. In many cases, they have been furnished by the generosity of private individuals. In others, individuals have found it profitable to supply them to those who deserved them, and were willing to pay for them. There seems to be no reason why the young farmer should not have equal facilities for perfecting himself in his occupation. But none of the causes we have mentioned as in operation in other departments, have given him the means.

The establishment of Farmers' Institutes, it is thought, would, to some extent, at least, supply these wants. The Board of Agriculture have no means in their power to enable them to

take any steps towards the establishment of these Institutes. It is desirable that some provision should be made at an early day with reference to this object.

Justice to myself requires me to say, that the duties of the Secretary are too arduous to be performed by a single person. During a part of the past year, I have found it necessary to employ an assistant at my own expense.

These duties, entered upon with great diffidence, and with a knowledge of the embarrassments arising from their manifold and responsible nature, and the undefined wants and unlimited expectations of many, are still constantly increasing. I must accordingly respectfully ask that provision be made for a permanent clerk, as soon as suitable office accommodations can be furnished.

In the preceding pages, I have endeavored to present as complete a view of the past and present condition of the agriculture of the Commonwealth, as the facts at my command made practicable; noticing, in the course of the statement, such wants as seemed to me to call for prompt action for their removal. On the whole, we have evidence of a gratifying progress in our agriculture, though it is still embarrassed by many deficiencies. More attention is paid to farming now than formerly. Intelligent cultivators are more numerous, and more successful, and there seems to be every reason to believe that the progress which has begun will continue, until at last the cultivation of the soil will take its proper rank among the various occupations in which the inhabitants of the State are engaged. That this result may be speedily arrived at, must be the earnest wish of all who have at heart the true interests of the Commonwealth.

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

Boston, January 23d, 1854.

REPORTS OF COMMITTEES

APPOINTED TO VISIT THE

Exhibitions of the Agricultural Societies.

ESSEX SOCIETY.

It was my duty, as well as my privilege as a member of this Board, to be present at the exhibition by the society in the County of Essex on the 28th and 29th of September.

I will, therefore, briefly as I may, make mention of such things as occurred to my mind upon that occasion.

The high reputation attained by this society had awakened great expectations. Very few societies in the State have done more to produce an interest in agriculture.

Much of this spirit still remains, and some of those who have served laboriously for thirty years or more, are still in the harness, while others have stepped aside to make room for those more energetic and efficient.

No want of ardor in the cause is chargeable upon Essex. She has certainly been most fortunate in raising a crop of men as well as *mind*—peculiarly adapted and most eminently qualified to advance the cause of agriculture. In past times she had her Pickerings and Colman, who have left their *mark*, and shall not the present strong friends of this time honored art in old Essex, as well as all parts of our country, be diligent and strong in placing one stone firmly on the other until a monument is completed worthy of the memory of these distinguished agriculturists? They were amongst the first in this country to suggest openly that agriculture was a science, and the last not to plough by reason of the cold.

The inclemency of the first day threw a damper over all the proceedings, and greatly curtailed the exhibition. Very little came in from the south part of the county, for this reason, as I was assured.

Essex is not a stock growing county; a large part of their animals are obtained from Maine, New Hampshire, and from Vermont—farmers thinking it more profitable to purchase young animals than to rear them, and in consequence of this conclusion, premiums are offered for animals of superior merits, without regard to their having been raised within the county or State. And it would seem that they do not claim credit for

rearing animals or improving their stock in this way. Whether they are right in this, is matter for serious consideration. My own impression is that the State bounty, so liberally offered to each society, was originally intended to be offered on stock of our own rearing within the State, if not the county in which it is offered. No animal can take a premium in Worcester County unless it be wholly the product of the county. This may be selfish; but it is the only way that a valuable race of animals can be perpetuated or improved, to my knowledge. This buying foreign stock from a foreign state has undoubtedly been induced by the *presumed* enhanced profits of supplying our markets with fresh milk instead of manufacturing it into butter, and the consequence is a large portion of our phosphates go to market never to be returned, in shape of what would be skimmed milk for rearing our best young calves or feeding swine. My own conclusion is, that this practice of offering premiums for other than stock of our rearing, does not have a tendency to promote the object our government had in view. It was stated at the dinner table by Mr. Lawson, I think, of Lowell, that he had imported two cows recently from the Isle of Jersey, of pure blood, and by repeated trials had obtained one pound of butter from four quarts of milk from the one he kept, and his neighbor who owned the other, had succeeded as often in making one pound and one ounce from the same quantity of milk. This statement undoubtedly is correct, as no one has ever contradicted it to my knowledge. Be it so; whilst from the best information that I can obtain, as an average of all the mongrel or accidental cows in the State, it takes eleven quarts of milk for a pound of butter. If we take the last census as evidence, we find the value of live stock in the United States to be far greater than all the manufacturing and mercantile interest put together. Yet who has ever heard of a legislature, either state or national, spending a breath of talk, or bestowing a thought on the breeding and rearing of a pure race of cattle that will give us certain results? The attention of the Board of Agriculture is most earnestly, though respectfully, called to this subject. And I am free to confess that, in my opinion, the State's bounty is not doing its intended work in many of the societies to which it is so liberally bestowed.

There were some good specimens of working oxen present, but nothing like what should have been exhibited. We greatly err if many teams in the county cannot be found which would present a better show.

The fat cattle, sixteen in number, were decidedly good.

Of horses, there were some very good animals on the ground, which did credit to the show. May not this branch of industry, also, be encouraged with profit in nearly all the counties in the State.

Of the operations in the ploughing field I can speak favorably without qualification. About forty teams were on the ground, of every variety. It is impossible to look upon such a performance without deriving instruction. The well-earned reputation of the county was fully sustained in this department.

Deep ploughing and thorough pulverization seem to be favorite ideas in Essex. These, they say, are the substratum of their superior crops. The hall in which were exhibited all articles of manufacture, products of the field and the garden, presented a fine, as well as creditable display.

The exhibition of swine and poultry was very satisfactory, and in most instances was well calculated to do credit to the individual contributors as well as to the society.

At the dinner table, as well as at the church, where the Address was delivered, we can say that nothing was lacking either in the way of food for body or mind. About five hundred sat down to a well-spread table, and I was happy to notice the harmony and good feeling which prevailed. Many distinguished friends of agriculture from abroad were present, and by invitation from Col. Newell, the president of the society, many short, though excellent as well as profitable, remarks and suggestions were made, mostly in discussing the merits of building up a race of pure blood cattle for the growing wants of our State. This was as it should be, and we came away from old Essex feeling that we had spent a day profitably in her courts.

HARVEY DODGE.

MIDDLESEX SOCIETY.

In compliance with the request of the State Board of Agriculture, the undersigned visited the Middlesex County Cattle Show, held at Concord on the 4th and 5th of October, 1853, it being their fifty-ninth anniversary. I arrived at Concord on the evening of the 4th, and found the society assembled in the Court House, consulting together for the public good, and arranging for the principal day of exhibition on the 5th. This day was as fine as could be desired; early in the morning there was a general movement of ladies and gentlemen, young and old, together with cattle, teams, and every imaginable thing that could move, or be moved, coming from every point of the compass, to the society's newly purchased exhibition ground and enclosure. This lot contains about five acres, and has been selected with much good taste and judgment; it is just far enough out from the village to give it a rural quietness. On it has been placed a building one hundred feet long by forty wide; the lot has been enclosed by a secure fence, and in this enclosure have been erected permanent pens for the cattle, sheep, swine and horses, and platforms for the poultry. A well has been dug, furnished with a pump, and posts have been put in the ground through which ropes are put, to protect the trial of oxen, and spading ground from the crowd. The building has been furnished with tables, table cloths, fruit dishes, and all that could be desired to accommodate exhibitors. At the entrance gate, has been erected a porter's lodge, for the transaction of business, and to receive the fee of entrance, a charge of twelve and a half cents, which fee must create quite a revenue for the society. The gross outlay for all these fixtures, including land, &c., is about $2,200. Nearly all this amount has been collected by the free services of Hon. Joseph T. Buckingham. A small surplus was in the treasury, and a small amount remains to be collected. In all this outlay, the society have scrupulously retained their original invested capital of three thousand dollars, entire. Your committee have deemed it advisable to be particular on this point, as they deem the doings of this so-

ciety of importance enough to be imitated, as far as practicable, by all the county societies, which are not now provided for.

The exhibition of fruits, was fine; Middlesex County has long been known for its fine growth of vegetables; it was well represented at this show. The exhibition of domestic manufactures, was in fine taste. The exhibition of butter, cheese, and bread, was a warrantee that the ladies had exercised their good judgment, and their "rights," in this department.

In the cattle pens, were to be found Durhams, Devons, Ayrshires, and Alderneys, and fine native stock. In the smaller pens were to be seen as fine swine as could be found anywhere else; in fact, there was ample evidence that Middlesex,—one of the largest, most populous, and wealthy counties in the Commonwealth,—meant to lead in breeding from the best stock known, whether of horses, cows, working oxen, swine, or poultry, that could be found in this country. The land in the enclosure is well adapted for the trial of working oxen. Some of the teams were patterns of correctness, in the quiet manner in which the work was done. The ploughing was done in the usual manner. The show of fine horses and oxen on such occasions, is always exhilarating; the fine horse teams, the double and single ox teams, many of them doing their work in a manner worthy of all praise. A spading match was held in the society's ground. This was new in this county; it was well conducted, and the work well done. This exhibition promises much, and should be introduced at all the annual county shows. The Address, by Hon. Lorenzo Sabine, should be read by every young man who is desirous of making progress, in this country; it abounded in wise maxims, and will do him much credit. After the Address, the society and invited guests, with the ladies, marched to the Town Hall. The banquet was got up in fine style, and was, as we were informed, the first occasion of the ladies joining. Judge Hoar, the president of the society, the master spirit of the day, presided on this occasion; his fitness for this department, as well as any other where he can be induced to act, cannot be excelled. Judge Hoar very discreetly, on this occasion, called out some of the old, who had been pioneers in this society. The ladies added much to the gayety of the occasion, all were pleased to see them, and

we trust hereafter, they will enforce their rights, and never permit the gentlemen to dine alone. We must not omit a practice which we learned incidentally, which we deem of much importance, viz.: a committee, previous to the exhibition, made a tour through the county, visiting farms, stock, fields, orchards, nurseries, &c., and in a free and leisure manner, learned the practices of the different farmers, and by comparison freshly collected, were able to make a most instructive report, which your committee consider of nearly, if not of quite as much importance as all the rest of the report, of the doings of the county.

The above is most respectfully submitted by your committee.

B. V. French.

WORCESTER SOCIETY.

Handling, a few days since, a parcel of refuse newspapers, in which minerals had been packed, a notice of the "First Cattle Show and Exhibition of Domestic Manufactures of the Worcester County Agricultural Society," met my eye. This was in the fall of 1819. The society was organized, says the old paper, in 1818, and at this first exhibition had five hundred and fifty members, and a fund of nearly $3,000. The occasion is described as one of great interest. Sixty pens were found too few for the one hundred and thirty-five animals presented, one hundred and twenty of which were competitors for premiums.

Hon. Judge Lincoln presided at the table, assisted by the Hon. Mr. Waldo, acting vice-president. Hon. Levi Lincoln delivered the Address.

In the exhibition, fifteen yoke of oxen were entered, and their strength and training tested by drawing a cart weighing eleven hundred two quarters and fourteen pounds gross weight, loaded with 4,920 pounds of stone, up a hill of four degrees, forty minutes elevation, and also by backing it up the same hill. They were further tried by being hitched to a drag loaded with

seventeen cwt. of stone, and drawing it up the same hill, and afterwards with a plough on a piece of uneven ground.

A five-year old ox, weighing 1,931 pounds, took the first premium for fat cattle, and one weighing 1,871 pounds, the second. Capt. Brooks, of Princeton, exhibited two fat oxen, one weighing 1,890, the other 1,862 pounds. Cattle, sheep, and swine in abundance were present.

Among the manufactured articles, were broadcloths, cassimeres, satinetts, hats, leather, &c. Nine skeins of tow yarn, from thirty-three to thirty-seven skeins to the pound, spun on a great wheel by a lady of Worcester, were exhibited. Mention is made of nearly seven hundred pounds of cheese among a great variety of other articles.

Thirty-four years have passed. The fathers have gone away. Another generation are the acting, moving spirits of the day; but the efficiency, thoroughness and energy in action, which appear so clearly marked in the arrangements of this first show, we distinctly recognized in the doings of the present season. At first view, we might overlook the great progress which the thirty-four years have produced. There was the same drawing and backing the two tons of stone up a hill, which we witnessed so successfully executed; and the number of animals exhibited, although falling much below the present number, was truly respectable. But a second thought will show the difference. There were, in 1853, working cattle, four years old, almost as heavy as the heaviest fat oxen of 1819. The horticultural department had, in this early show, scarcely a germ of existence. A department that, some years since, had become so extensive that it was deemed expedient to colonize it, and the Worcester County Horticultural Society, with its splendid hall and its three days' exhibition, its 700 entries of pears, 229 of apples, 213 of other fruits, its 151 entries of vegetables, and 86 of flowers, is now an independent organization, under its own board of gentlemanly and efficient officers. Having had its birth and training in the old mansion, it has, in accordance with the true law of progress, gone out, and is doing a splendid business on its own account. So of the results of mechanical and manufacturing labor. These have, for the most part, disappeared from the agricultural show; but it is not because they have

ceased to exist, but because they outgrew the limits assigned them, and required a new organization and more extended limits. Hence, another colony, "The Worcester Mechanics' Association," making, occasionally, a most splendid display of the productions of art and skill, and doing honor to herself and honor to her parentage.

Having settled these two daughters so happily, and given to each the best of all marriage portions, a good practical education, for the business of their choice, and habits of industry and energetic action in that business, the old society has concentrated her resources and redoubled her energies. A beautiful plot of seven acres of land has this year been purchased and enclosed with a heavy board fence, having massive granite posts. The grounds have been graded, very substantially framed pens built, and preparations put in progress for large and commodious halls, for all the wants of the society. Within this enclosure are all the items of the show, except the ploughing and the drawing match, and to it a fee of ten or twelve cents gives admission. A small building, already erected, was occupied by the secretary, and also for the exhibition of butter and cheese, and "Wright's Tent" sheltered the dinner, the annual Address, and all things pertaining to that department. Some inconveniencies attended the unfinished state of plans projected, but the energy of the executive board was more than sufficient for all these.

It is not necessary or desirable that I should enter largely into the statistics of this exhibition. Her own reports will do this far better than I can. For ploughing, the premiums were well contested. This society, in common with many others, finds it somewhat difficult to find good ground within a reasonable distance. The land ploughed was somewhat uneven, not free from stone, nor uniform in the depth of the surface soil. The teams were mostly oxen, a part of them composed of two yoke, almost invariably in good flesh and strength, and well trained. Both the ploughing, and subsequent drawing and backing, showed that thorough training of cattle is here a thing well understood and generally pursued. The ploughs were, for the most part, of the larger class. The double, or Michigan, was conspicuous in the number. We notice, in all our societies,

heavier ploughs and deeper ploughing is becoming the order of the day. The work was done with a good degree of deliberation, and good ploughing was evidently the first object of most of the competitors. The drawing succeeded the ploughing, and elicited quite as much attention. Entering upon the grounds of the society, we witnessed a trial of three year-old steers on a cart loaded with stone. The exhibition, both in drawing and backing, was very satisfactory. The "no progress men" knew, as usual, that the steers were "at least a year older than they were called, because they were too large for three-year olds." But the training was as tall as the cattle.

In the pens was a beautiful display of Devon cattle, by Mr. Dodge, of Sutton, and a fine exhibition of Ayrshires, by Mr. Brooks, of Princeton. There was a large number of various ages in each collection. Many fine animals were entered by other members. Some fine Alderney cows were placed on exhibition for the pleasure of the society by Mr. Salisbury. They had been off ship some three or four days only, and bore the marks of an unusually long and severe voyage, notwithstanding all which, the beautiful animals were fully recognized. In horses, a larger exhibition may be expected another season. The number of swine was not very large, but the animals were generally decidedly good. Some of them very large. The exhibition of sheep was fair, and the poultry was out in full feather.

In the number of cows and amount of butter and cheese, we were somewhat disappointed. The cows, all told, fell below a dozen, and the entries of butter and cheese did not much exceed ten or twelve of each. In a county so preëminently a grazing county that no premiums are offered for corn or other grain crops, we looked for a large exhibition of cows, and of all the products of the cow. The premiums were liberal, but the competitors few.

The Worcester County Agricultural Society is now a society of *men*. It has but a feeble hold on the sympathies and smiles of the ladies, so far as may be inferred from their coöperation in the festivities of the occasion. This, we view, a serious loss, and yet we see no way that it can be avoided. Should a second day be allotted to the show, giving more time for the dinner,

we see not why the ladies might not still be efficient co-workers at least in one important part of the transactions of the day.

The number of persons in attendance was also less than at some other gatherings of a similar character. This was the more noticeable from the place of the exhibition, at the heart of the Commonwealth, and the heart of so large and rich an agricultural county, especially in connection with the fact that but one day was devoted to the show.

Two things appear to us extremely desirable in the affairs of an agricultural society. The first is definiteness and accuracy in all its doings. To this the Worcester Society have directed much attention, and in a high degree secured their object.

Very accurate measurements are required in every thing capable of being thus determined, and full and definite statements of what it is, and how it was produced, made the condition of all successful competition. So far as we have observed, the Worcester Society is, in this particular, leading all the other associations in the State.

We place popularity as the second object, or rather the equally important object. We use the term in a high and noble sense, as designating that power which takes hold on the great mass of the people, moving the heart to activity in personal investigation, and the hand to energetic action; which shall give the society and its interests a place in all the plans of the season; which shall cause "*Cattle Show*" in all the dwellings, not only in the sunny valley, but on the colder hill-sides, to be an era from which, like Thanksgiving and 4th of July, time shall be measured; an event of which every farmer shall speak as of a concern in which he has a personal interest, entitling him to use the terms *we* and *our* whenever he speaks of it, and of his purposes in reference to it. Without this popularity, a society will become a club of amateurs, making many valuable investigations, and recording them for the instruction of the world; but when the results of that instruction are looked for, the truth will appear, that the eye must be opened before it can be made to see, and inquiry elicited, before the answer will be needed, and that in agricultural education, as well as in all other education, personal exertion and personal interest, are indispensable to success.

Without a proper combination of these two great objects, and, without in some good degree, securing both, a society must fail of accomplishing its great designs. To this point, more than to any other, in our intercourse with different societies for the last two years, have we given thought and attention; and in our mind, there is no one which has stronger claims on the attention of the Board.

Although we may have extended this report to an unwarranted length, we must be permitted to add, that a most cordial reception was given us by the Worcester Society, and that nothing was omitted on the part of its officers, which could facilitate our purpose, or contribute to our comfort or pleasure. We extend the same acknowledgments to the gentlemanly officers of the Horticultural Society, and tender, personally, and in behalf of the Board, to all, expressions of corresponding gratitude and kind remembrance.

S. Reed.

HAMPSHIRE, FRANKLIN AND HAMPDEN SOCIETY.

The annual exhibition of the Hampshire, Franklin and Hampden Society took place at Northampton, on Tuesday and Wednesday, the 11th and 12th of October. The weather was favorable, and all circumstances seemed to conspire to make the occasion an agreeable and profitable one. The morning of the first day was bright, with a cool and bracing air, so that the men of the hill-country and of the valleys, with their pleasant wives and daughters, came out with hearty good will to join the happy festival. I was fortunate in being on the ground early in the morning to see the cattle, horses, sheep, and swine, in single groups as well as collectively.

My attention—after the stock had generally come upon the ground—was first directed to the swine. The collection was not numerous, but there were several lots of fine propor-

tions, which did credit to their keepers. There were none of entire purity of any one blood.

From the swine I passed to the sheep, among which were the French and Spanish Merinos and Silesian; they appeared finely, and did not belong to that class of which there is "a great cry and little wool."

The working oxen, twenty-five pairs from South Hadley, and about as many more from Hadley, with many single pairs, attracted especial attention. They were mostly of the common breed, were of fine size and form, and, I believe, could not be excelled by an equal number of any particular breed in the country; and when I afterward saw their skill and power when hitched to the cart and plough, I felt confirmed in the opinion, formed while standing by their side in the morning, that they cannot be excelled by any other breed for actual service on the road or farm. Whether they can be, as intended for the shambles, I was not so clear.

In the department of fat cattle, I have seen nothing at any of the shows this autumn to compare favorably with those exhibited at Northampton. They were numerous and of the highest order. One pair, exhibited by Moses Stebbins, of Deerfield, weighed 4,300 pounds. A pair from Hatfield, presented by Mr. Billings, weighed 5,000 pounds. Edmund Smith, of South Hadley, presented a pair of steers, two years and nine months old, that weighed 3,070 pounds. The oxen by Mr. Stebbins were of the Devon blood, and the steers by Mr. Smith, of the Short-horn. A pair of four-year old oxen weighing 4,380 pounds, which were very fine, were presented by Cephas May, of Conway.

Some excellent milch cows were on the ground, though there were not many in all, presented. One, owned by Jotham A. Clark, had produced fifteen pounds and one ounce of butter in seven days, with only the common pasture feed. She was bred by the president of the society, the Hon. Paoli Lathrop, from his famous stock of Short-horns.

Among the young cattle I noticed marks of the Hereford, Short-horn, Devon, and Ayrshire blood, mingled with our native. I was particularly pleased with a very fine Short-horn heifer, the property of Mr. Lathrop, and another, one year and

twelve days old, for which he informed me he could have taken $200.

In the Exhibition Hall, the fruits were abundant. Around a dish of the common crab apple, were thirty varieties of fine fruit, all springing from that common centre; reading to all a homily upon the effects of careful culture.

There was a fine variety of vegetables, giving plenty of evidence that the garden is appreciated. The poultry was in full feather—the cocks as noisy as ever, and the hens crammed in their narrow coops, speaking as loudly as they could—"I can't get out—I can't get out!"

There were very few farm implements—Ketchum's mowing machine, a hay cutter or two, and some small tools, comprising the whole display.

What pleased me much was a hydraulic ram, set up, and, water being supplied, showing to all on the spot its practical working. This was worth more to the multitude, than whole quires of description.

The drawing match was well contested—load 3,000 pounds; teams and teamsters, skilful.

Of horses there was a good show—some of them very fine.

Sixteen teams ploughed, mostly two horses; a pair of horses, owned and driven by Mr. Elisha Strong, of Northampton, while he himself held the plough, did the work with more ease, exactness and skill than I ever witnessed before; and this I say, living as I do, among many of the best ploughmen in the country. Mr. Strong had no whip, and no loud word escaped his lips during the time he was engaged. There was perfect harmony between himself and team; a single low tone would arrest, or haw or gee them instantly, or quicken or decrease their movements. On coming out of the furrow and mingling with another team from the opposite land, a single word would extricate them with almost mechanical precision. That single exhibition of skill was the admiration of every beholder.

The services at the church were exceedingly interesting. The Address was by Wm. S. King, Esq., editor of the *Journal of Agriculture*. His subject was: "How can farming be made to pay," and the general divisions were,

1. That it does not now pay as it ought to, and as liberally as other occupations.

2. Why it does not pay.

3. How it can be made to pay.

Under these general divisions, Mr. King went into details of importance and interest to every farmer. He thought that those engaged in other occupations, had generally brought more mind to bear upon them, and conducted their affairs more systematically and certainly. Men were reluctant to acknowledge science to be an application of the mind to their business. He spoke of the maximum, minimum, and average crops of the State of Rhode Island; carrots had a range of from one thousand to seventy-five bushels per acre, while the average was four hundred bushels; onions, from six hundred to fifty, with an average of three hundred; corn, forty; rye, forty to three, average twelve and a half; hay, three tons to half a ton per acre, with an average of one ton. The Address was practical and earnest, and was listened to with close attention by a large audience.

After the Address, a most interesting report was read by Rev. M. E. White, of Southampton, on Domestic Manufactures.

At the dinner table, Mr. Lathrop, the president, introduced the company to each other in general terms, spoke of the pleasures of the farmers' festival, of the gratification and honor he felt in being the president of such an association, and then introduced the secretary, W. O. Gorham, Esq., who spoke of the value and moral effect of these gatherings, in the most brilliant and beautiful terms.

Intermingled with the reports of the society, were short speeches, from several persons. Your secretary was present, and spoke earnestly and eloquently of the importance of the occupation, to us all, and of the high satisfaction he felt in witnessing such a degree of perfection and prosperity in the society.

Your delegate spoke to them briefly, of the beautiful town where they had assembled—of their mountain scenery, sweeping meadows, and natural fertility of the soil. He also alluded to some of the popular errors of the day, in relation to farming, such as:—

1st. That farming, as an occupation, is not profitable. This idea is carefully inculcated, why, he knew not, and is working incalculable mischief in the country, by turning the industry of thousands of both sexes into other channels, who, otherwise, would have engaged in this primitive and healthful employment.

2d. That the prevalent and pernicious opinion has prevailed among all our people, that "any body would do for a farmer!" That, if among a family of children there were evidences in some of unusual aptitude and talent, those must be selected for other professions, and aided by all the helps of our schools and colleges. While the dull and indifferent would make good-enough farmers! These were errors, he thought, resting like an incubus upon the community, and paralyzing the efforts of the friends of the cause. And

3d. That, as a great class, we had not sought the aid and countenance of the other sex, and made the occupation an agreeable and attractive one to them. In the mechanical department, and especially in manufactures, the best minds are exercised to please the eye, lighten the labor, and gratify the taste of the females of our households. This will be evident to all on entering the shops of the mechanic, or looking upon the shelves of the merchant. But with the farmer it has not been so. With women, the prevalent idea of the farm-house, is, that of drudgery. They have been made to believe that the refinements and elegancies of life are there out of place; that books, recreation, healthful amusements, and interchanges of visits are for those engaged in other avocations. How often is the farm embellished with a beautiful garden, filled with fruits, shrubbery and flowers, attracting all into its peaceful shades, or to inhale its fragrant breath! Or, the farm-house, supplied with those nameless conveniences or comforts, or luxuries, in the way of furniture or ornament, which may be found in the dwelling of the merchant, the physician, the mechanic, and often, even, in that of the day laborer! If they are necessary, they are as much so to the wives and daughters of the farmer, as to any other class. If they can be afforded by the mechanic, or the shop-keeper, they certainly can by the farmer.

Remarks were also made by Dr. Cleaveland, of Northampton.

Many ladies were present, and greatly enhanced the enjoyments of the occasion.

The exhibition, then, in all its principal features, I consider a successful one; indicating progress and profit in the great art. In saying this, however, your delegate does not believe that he is answering the full expectation of the State, as a return for its encouragement and bounty to the several societies. The condition of agriculture, I believe, will afford a pretty fair index of the condition of the people. If agriculture is feebly sustained, we shall find the mechanic arts, manufactures, and commerce, suffering with it; and even religion, literature, and the fine arts, will take their hue from the condition of agriculture, in the State. If prospering, it imparts life and energy to every other calling. This exhibition afforded evidence that the farmer is progressing and prosperous. The churches and school-houses, gave evidence of this; so did the homesteads, the fences, the fields, barns, stock, implements, and the urbanity and refinement of manner of the people themselves. A great contrast would be noticeable to the traveller through the State, at the present time, and twenty years ago. Comparatively few tenements can be found now, unpainted, and presenting few appearances of comfort, while, at that period, many were everywhere observable, dilapidated, loose, and leaning, with hingeless doors, and windows darkened with cast-off hats and pantaloons. Fences were straggling—cattle shivered by the road-side, or poached the fields during the day, and cringed in their stanchcons at night, over scanty fodderings of meadow hay. With a higher degree of the cultivation of the soil, a higher standard of morals has grown up, and these combined, give a new aspect to the face of the earth, and to society. Our foster-mother, the good old Commonwealth, ought to know that her munificence is appreciated, and is working important and favorable changes in the condition of her children.

Respectfully submitted by

SIMON BROWN.

FRANKLIN SOCIETY.

It was my privilege, under the direction of the State Board of Agriculture, to be present at Greenfield on the 6th and 7th days of October. This was the fourth exhibition by this flourishing Society. I have witnessed many of the kind, but none that impressed me more favorably, by the order and propriety of movement throughout. Many of the most prominent citizens of the county engaged heartily in directing the concerns; all ready to work, no one appearing to feel above his business. This is emphatically the farmers' working day; whoever takes part at a cattle show, must be ready "to hold or drive," as occasion may demand.

The object that first arrested my attention, was a team of about one hundred pairs of working oxen, gathered from the adjoining towns; more from the good farming town of Shelburne, than any other. These oxen, I estimated to average about five years old, and to girt six and a half feet. Many of them were well mated and in fine condition.

My attention was next directed to the milch cows, as an essential part of the cattle show. I was informed that the number of animals presented of this class, was about thirty; but most of them had left the ground before one o'clock, P. M., of the first day. I was disappointed, in not seeing these animals, and so must many others have been who came to see. All animals entered at such an exhibition, should remain on the ground, and be fed from a common stock, until the show is over. I learned from the chairman of the committee on cows, that one of those exhibited, had yielded more than sixteen pounds of butter in a week. Such a cow would be creditable to any exhibition. They are not often found to do this upon pasture feed only—which is the only fair way of testing their quality for dairy purposes. When pampered with shorts, Indian meal, carrots, or other extra feed, they may do great things for a short time, but their ability to do so will soon be exhausted. Without hesitation, I should say, that a cow which yields two pounds of butter a day, on common pasture feed,

from June to October, may be set down as a very superior cow. Among the heifers, I noticed several from the island of Jersey, recently imported by Judge Grennell. I am glad that the farmers of the county will thus have an opportunity of seeing specimens of this class of which so much is said. Of the quality of their milk for the making of butter, there can be no question. Of the quantity, I am not fully informed, but think favorably. I have seen one of these cows at Nahant, that yielded eighteen quarts of milk, daily.

Of bulls, there was a good number, about twenty in all, some of them very superior animals. Too much attention cannot be paid to the selection of males, for the rearing of stock. I should as soon think of raising "figs from thistles," as good progeny from inferior bulls. All those best experienced in these matters, are particular, not only to have their bulls of good character in themselves, but the descendants of those of good character. I am satisfied that no animals are worthy of premium, that have not been reared with particular regard to their quality. Why should a premium be awarded for an animal that chances to be good? To be sure, such animals may occasionally be found, but no one can claim any merit for their being so. The object of cattle shows is, to give opportunity to reward praiseworthy efforts in improving stock. With this view, many are anxious to introduce upon our farms improved breeds of animals, from foreign countries; and without doubt, benefits may accrue in this way. But my impression is, we have, in the native stock of our own hills, as good stamina for improvement, as can anywhere be found. Certainly, for labor and the dairy, the two grand purposes of keeping animals. Perhaps some of the full fed Durhams may grow larger than the natives; but these when well fed, will answer all ordinary purposes, and they may be kept at much less expense.

In my admiration of the working ox, I had almost forgotten to notice the fatted ox, of which there were a number that weighed, alive, more than two thousand pounds. Seven premiums were awarded for fat oxen; and I fully concur in the opinion expressed by the discriminating chairman of this committee, that those who would entitle themselves to a premium

for fine animals, should, at the same time, furnish an intelligent statement how they were made so, as did Mr. Charles Wells, of the pair of cattle raised on his farm. The main purpose of premiums is, to elicit information, to enable others to "go and do likewise."

There was an exhibition of sheep, such as befitted the fine pastures in this mountainous region. Some of almost every variety, and of superior excellence. Not being expert in the distinguishing characters of these useful animals, I must leave their merits to be spoken of particularly, by the committee that examined them.

The show of steers was very good indeed, most of those exhibited being marked with Durham blood; indicating more favorably of this class of animals, than I have ever before witnessed, and affording evidence unmistakable, if size is the consideration principally to be regarded, the Durhams go ahead of all others. When ten pair of two-year olds, averaging 2,500 pounds, and eight pair of three-year olds, averaging more than 3,000 pounds, are brought together in one small county, as was here done, I am disposed to say, "beat this who can."

Of the swine exhibited, I saw but little; my attention was attracted mostly to the elaborate report of the distinguished chairman of the committee. The growing of swine, is one of the objects demanding the constant attention of the farmer; both as it relates to his profit in the business, and the improvement of his lands, in preparing fertilizing materials for his crops. I know of farms where the net profits of the swine kept thereon exceed a thousand dollars annually; no mean item in the balance sheet of the farmer.

Of horses, the show was very superior, far surpassing any before seen in the county, and, as I was informed, in any adjoining county. It is gratifying to witness the increased attention given to the rearing of this useful animal; and particularly to insuring animals of the best blood. It is quite as easy to rear an animal that will be worth one hundred dollars or more, at three years old, as one-quarter part this amount, by care in beginning right. Whoever will presume to grow horses should be mindful how they start. Good blood in a horse, should

be first sought in all efforts at rearing them. He that buys any thing short of this, will surely "pay dear for his whistle."

Space will not admit of reference, in detail, to many other objects exhibited. Suffice it to say, that the spacious new Town Hall of Greenfield—worthy of any city in the State—was well filled throughout, affording a gratifying view to a numerous crowd of visitors, and a remunerating income to the managers of the exhibition. This mingling of the "sweet with the useful," in agricultural exhibitions, is a new feature, but one that contains within itself, when properly regulated, a self-sustaining power, almost equivalent to perpetual motion. Wisely have the citizens of this beautiful town, thus freely furnished such ample accommodations for their friends and neighbors, the farmers of the county; thereby giving a permanence to the place of exhibition—a thing greatly desired in many counties, where it cannot conveniently be had.

On the ploughing field were about a dozen teams, which performed their work to admiration. There should have been three times as many. Although great perfection has been attained in this fundamental operation on the farm, there is still room for very great improvements. Who thought, five years ago, of the benefits to be derived from the operations of the double plough, that lays five inches of the under soil directly upon three inches of the sod, and in a form so broken and pulverized, as to be fit for immediate culture. This improved implement alone, if I do not mistake, will be a saving of thousands of dollars, annually, to the Commonwealth. The more I see of its operations, the better I like it; and never have I witnessed it holden more successfully, than on the meadow banks of the Connecticut, at Greenfield.

While all the performances in the field were so satisfactorily completed, the indoor operations were equally well done. A crowded assemblage of stalwart yeomanry listened for one and a half hours, to the fluent and sensible discourse of Dr. D. Lee, of Rochester, N. Y. Without the embarrassment of notes, he proceeded to explain the phenomena of vegetable culture and growth, with his ear of corn and potato in hand, in a manner that commanded the undivided attention of his

hearers. This is the talk for farmers. They want none of your high wrought, speculative disquisitions on super-phosphates, and the like.

I have only time to express my acknowledgments, for the kind attentions I received from the president and secretary of the society.

JOHN W. PROCTOR.

BERKSHIRE SOCIETY.

Having been honored by your Board, with the appointment of delegate to the annual autumnal exhibition and show of the Berkshire County Society, I beg leave briefly to submit some of the results of my observations. I considered myself peculiarly fortunate, in being delegated to this frontier county, as I had long had a desire to extend my acquaintance with that favored section of the Commonwealth. My pursuits in life not having run in an agricultural line, I may not be able fully and justly to appreciate all the excellencies of the exhibition, or speak of them with the authority of a practical, or even theoretical farmer. Yet, there was so much that was undeniably good, and worthy of admiration, that I must have been profoundly stupid, as well as ignorant, not to have had some appreciation, at least, of what I witnessed with so much pleasure and satisfaction.

The exhibition was held in Pittsfield, one of the most beautiful towns, in all our dear New England, and in one of the grandest counties that the sun shines upon. If nature has made Berkshire the most magnificent county in the Commonwealth, art, as if not to be outdone, has rendered her one of the most beautiful. Take any of her hill-tops, as a stand point, the eye never rested upon a more splendid panorama. Travel over her surface, and everywhere evidences are present, of intelligence, wealth, industry, social culture and successful husbandry.

The show certainly did honor to so favored a county, particularly excelling in those departments of agriculture that for their highest success require good grazing land. Hence, the specimens of stock were of a high order. The working oxen, steers and cows, spoke for themselves, that they had the best of pasturage, and the kindest care. One cow was exhibited, three-fourths Durham, and one-fourth native, that yielded sixteen quarts of milk a day, from June to October. The exhibition of sheep, also, was remarkably fine. Some sections of Vermont might equal it, but nowhere in Massachusetts could such flocks be produced. One buck was shown, that sheared ten pounds and ten ounces of wool, at one shearing.

In like manner the results of the dairy, butter and cheese, would do credit to Orange County, in New York, or to any section, in or out of New England. There were twelve entries of cheese, several single ones weighing sixty pounds. The show of swine was very good, and so was that of fowls; in the raising of which there appears to be an increasing interest, here and elsewhere.

In regard to fruits, the year, as is well known, was not favorable to the apple, still there were some very fine specimens, and also of pears and quinces.

Specimens of potatoes and other roots, and garden vegetables were very respectable, and there was a remarkably fine show of grass seed.

The excellence of such exhibitions, as the one we are considering, does not consist, in my judgment, in presenting a few solitary specimens of mammoth growth, which may be, to be sure, objects of curiosity, but in the average good quality of the products shown. Judged by this standard, the Pittsfield exhibition would stand high.

One of the most interesting and attractive features of the exhibition, was the handiwork of the fair ladies of Berkshire. The most beautiful yarns, counterpanes, carpetings, and fancy work, of various kinds, were displayed throughout the spacious hall, all of which were highly creditable to the ingenuity, skill, and taste of those who wrought the fabrics.

An exhibition of trotting horses came off toward the close of the first day, and a goodly number of beautiful animals ex-

cited the admiration of the numerous spectators. Not being able to remain the second day, I unfortunately missed seeing the ploughing match.

Respectfully submitted,

ELISHA HUNTINGTON.

HOUSATONIC SOCIETY.

It is somewhat singular, that in the three years that this Board and its predecessor has sent delegates to the several societies, there has been a failure in every instance, of those accredited to the Housatonic. It has, consequently, fallen to the lot of my Berkshire colleague and myself, alternately, on notice given, not "the day after the fair," but many days after, to make a note of its transactions. The Housatonic Society is deserving of better treatment.

This is comparatively a young society. Its members are thorough-going, active farmers and other citizens. They are working men, willing to investigate the principles which lie at the foundation of good culture in all things, and to test the results by the labor of their own hands. Great Barrington, the place of the annual gathering, is a beautiful village, in the Valley of the Housatonic, directly and easily accessible by railroad, at all times. The exhibitions of the society are always good, and always well attended by the great mass of the people. We are not sufficiently conversant with all parts of the State to speak with certainty, but we doubt whether a society more truly popular, one standing higher in the affections of the whole people, of all ages and employments, can be found in the Commonwealth. Certainly, very few can be found, in which the liberality of the State produces a return of richer blessings on the whole people.

This society uses funds with a most laudable economy. The contingent expenses are kept down to a very low point, and

every dollar made to tell upon the encouragement of beneficial objects.

The reports of the various committees will show the extent and variety of objects fostered by the society. The premiums in every department are warmly contested. The results of the contest show, beyond all dispute, that mind as well as muscle is active; that the largest manure heap will not command the largest premium, without skill in using it; that the man who enters ordinary animals which have "come up" without plan and careful attention to breeding and judicious feeding, and if oxen, matching and training, cannot carry away many "cups or spoons;" that the day has passed, when comparisons are to be made between spontaneous productions; but, that the best efforts of nature must be aided by good judgment and judicious culture, in order to command the smiles of committees.

The Housatonic Society, like the old Berkshire, finds full business for two days. All entries are made in the forenoon of the first day. The afternoon is in the hands of the committees, during which all entries are examined, crops excepted. These are previously entered and examined in the field, when as near maturity as may be; two visits being made, one for the summer, and one for fall crops. At the close of the first day, animals may be removed if their owners wish.

The ploughing match is the first object on the second day, and calls to the field a great multitude, of both sexes, in carriages and on foot. The horticultural department, the domestic manufactures, the specimens of taste and skill from the hands of the ladies, the butter and cheese, in which there are often twenty or more competitors, the agricultural and mechanical implements, etc., are open to the inspection of all without fee, the principle being, the greatest facilities for all to see and learn, that they may go away and do likewise.

At eleven o'clock, the society, and more of the rest of the world than can get within hearing distance, repair to the church, where the Pilgrim's God is acknowledged as the giver of the sunshine and the shower, and His blessing supplicated for the labors of another year. The annual Address is then given; after which, the reports—the last anniversary abstracts of reports—read and the premiums, in silver plate, distributed

to the successful competitors. This public coronation of the victor, not with a myrtle wreath, but with a silver trophy, is not without its effect.

The dinner is the closing exercise of the day, and always proves that the day is too short.

The Housatonic Society is in a very healthy and prosperous condition, and doing a great and good work for Southern Berkshire.

S. Reed.

BRISTOL SOCIETY.

The undersigned, a committee appointed by the Massachusetts Board of Agriculture, to visit the Bristol County Agricultural Society, respectfully report:—

That, in consequence of a severe domestic affliction in the family of the undersigned, at the time of the annual exhibition of the above-named society, he was unable to be present to perform the duty assigned. His inability was deeply regretted, especially as your committee was charged with a similar duty the last year, and which he was, from confinement to a sick bed, incapacitated from discharging.

Your committee, however, have the pleasure to state, that from information of the most reliable character, the exhibition was in all its parts, of a highly creditable order, to which the Secretary of the Board, who was present, can bear testimony; that in several of the departments, the products were better than ever before; that a marked, progressive improvement had been going on since the elevation to the chair of the society of its present energetic presiding officers. Whatever praise may be awarded to the other members of this vigorous and flourishing association, it is but justice to state, that much of the zeal now manifested by the good people of Bristol, in the welfare of their society, has arisen from the interest evinced by its efficient head in the cause of agriculture,

and in a desire to place the Bristol Society on a par with the most favored society in the State.

The undersigned regrets that he has not the means of making a full and detailed report, but hopes, if a kind Providence should spare his life and health, that at some future day he may be able to perform the agreeable service which has been heretofore assigned to him.

MARSHALL P. WILDER.

METEOROLOGICAL RESEARCH.

The following communication has been made to the Board of Agriculture on the Climate of New England. An important point in inquiries of this nature is, whether the periodical returns of extreme cold are not less frequent now, or, in other words, whether the cycles of change have not been materially lengthened. It is believed by many scientific men, and thought to be strikingly corroborated by observation, that they have. This question, it will be seen, did not come within the range of the writer's investigation. The recurrence of what is called the "January thaw" is, it is thought, far more irregular now than formerly, while the phenomena of the Aurora Borealis appear far more frequently. The appearance of these phenomena was comparatively rare many years ago. Whether they are connected with any change of climate is not yet fully known. The paper is so interesting and valuable that it is given entire:—

REMARKS ON THE CLIMATE OF NEW ENGLAND.

BY J. C. GRAY.

It has been a general, and is perhaps still a prevailing impression among the inhabitants of New England, that our climate is much warmer now than two hundred years since. This position has been distinctly assumed by some of our best historians and naturalists, and many ingenious reasons have been given for the change. The explanation which seems to have met with most favor is that which ascribes the alleged softening of the winter's cold to the clearing away of large tracts of forest trees. It is believed, however, that the position itself may be fairly called in question, and that philosophers, by a mistake not unprecedented in the observers of natural phenomena, have employed themselves much more diligently in accounting for a striking phenomenon which they have assumed to exist, than in collecting precise evidence to determine the fact of such existence. Much less of this evidence exists than could be wished,

or than is now customary to collect and preserve on all scientific topics. The science of meteorology, or the observance of the weather, in the largest sense of the words, is even now in its infancy, and the instruments necessary to carrying on such observations with precision, are of very modern date. The thermometer was little used in this country, or even in older countries, previous to the last century, and all instruments of this kind employed in the early part of that century were very imperfect. Till after the year 1750, the only thermometer used in New England was Hawksbee's. Not a single specimen of this instrument is now known to exist. There is good reason, however, to believe that it was much less accurate than any thermometer now employed. During more than half a century, however, that of Fahrenheit has been in general use throughout New England at least, and we possess an exact register of observations made with it during more than forty years on one spot, and by one individual, the venerable Dr. Holyoke, of Salem. A particular account of this register may be found in a valuable paper by the late Dr. E. Hale, in the Transactions of the American Academy, Vol. 1, New Series. The temperature of each day was thrice noted at the same hours during the whole period. As a comparative statement, therefore, of the earlier and later portions of that period, it is of singular value. No conclusion can be drawn from it, as Dr Hale has clearly shown, favoring, in the least, the popular impression respecting the amelioration of our climate. On the contrary, it seems evident from Dr. Hale's Essay, that from the year 1786 to the year 1829, the climate of the vicinity of Boston has continued essentially the same. It should be recollected that in no previous period, of equal length, were the changes greater or more extensive in the face of our country, as well as the condition of its inhabitants, or greater inroads made on our ancient forests.

There is another interesting as well as important mode of procuring light upon this question of change of climate, viz.: by observing for years in succession the periodical changes in the vegetation of our trees and shrubs. It has been observed by the late Mr. Lowell, that "had there been precise records kept of the date of flowering of trees in certain specific locations from the first settlement of the country, very much would

have been done for the decision of the whole question as to change of climate." The venerable pear tree of Gov. Endicott, had its times of flowering been punctually recorded by its seven successive generations of proprietors, might have put all dispute at rest. We possess no ancient registers of this description kept with the exactness which Mr. Lowell recommended, and which he actually put in practice at Roxbury through a period of thirty-two years. But we have a similar record kept, on the whole, with great regularity, by the late Rev. Thomas Smith, of Portland, Maine. His diary of the seasons extends, with a few unimportant exceptions, from 1722 to 1786, thus reaching back to a century and a quarter ago. It appears from several observations, made by him between the years 1751 and 1773, that the average time of the blossoming of the cherry at Portland, during that period, was between the 12th and 13th of May. Mr. Lowell states that the average at Roxbury, for several years since the commencement of this century, was May 8th; and from observations made by Gen. Dearborn in the same city, from 1835 to 1847, inclusive, it appears that this average should be fixed precisely at the same date within a fraction of a day. When we consider that Portland lies north of Boston by more than one degree, these facts, to which many of a similar purport might be added, would seem to form evidence as conclusive as, under the circumstances, could reasonably be expected, against any supposition of a perceptible change in our climate since the settlement of our country. Besides, had such a change occurred to any material extent, we should find some proofs of its existence in what are called our half-hardy plants, that is, plants which are a little, and only a little, too tender to be exposed without protection throughout the year. Could it be shown, for example, that that most beautiful evergreen, the English Ivy, which has been cultivated by our florists for more than half a century, could now endure our winters better than formerly, this would furnish a proof of the softening of our climate which it would be difficult to set aside. But we shall search in vain for any instance of this description. Among the many species of trees and shrubs which have been cultivated in our gardens for two or three generations, it may be safely asserted that there is not one which appears to have increased

in hardiness. But it may be asked in what way we are to account for the impression that our climate has been growing warmer since the settlement of our country, since neither the existence nor the strength of the impression can in any degree be gainsaid. A sufficient answer has been given by Dr. Hale, viz.: that extraordinary seasons are remembered when the intermediate years which are not marked by any unusual prevalence of heat or cold, are forgotten. As strong instances in confirmation of Dr. Hale's remark, we need only call to mind the repeated references which we find in our annals, and which many of us recollect in the conversation of our predecessors of the last generation, to the long and dreary winter of 1779–80, to which Virgil's highly ornamented description of Scythian cold might be applied with prosaic exactness. Those of us who have passed the middle age, retain an equally distinct recollection of the cold summer of 1816. Both these extraordinary seasons dwelt tenaciously and distinctly in the memory of many who could give no other account, however general, of most other summers and winters of their time. It is not to be doubted that the severe winter which occurred a few years since, when a channel was hewn through the solid ice in Boston harbor, in order to enable the steam vessel to proceed on her regular voyage, will be often appealed to by writers of the next generation as positive proof of the extreme rigor of our winters at the present day.

Impressions of this description are particularly vivid in our younger days. We all can recollect those made upon us by such striking natural phenomena as occurred just within our recollection, and more especially by those of our early winters. When we recall the mountainous snow drifts, huge icicles, and nipping blasts of those periods, we can hardly realize that any winters of our later days are both equally severe and equally magnificent; and yet, all the precise evidence which we possess compels us so to admit. It may be further observed, that the severe winters of the last century have been recollected the more vividly, because they were more severely felt than any winter of the same severity would now be. Our people are better clothed, our dwellings better fortified against cold, and what is of still more moment, our roads are far more quickly

rendered passable after heavy storms. A mass of snow which sixty years since might have rendered travelling in our thinly peopled country all but impossible for weeks together, is now cleared away or beaten down in a very few days.

A single extract from Smith's Diary, (the work above referred to,) will show that former generations had their mild as well as their severe winters. Under date of March 7, 1775, he remarks, that the frost seemed out of the ground in the streets of Falmouth, (now Portland,) and this he calls a wonderful winter, and so it would now be considered. It was not, however, unexampled, for Mount, in his relation of the affairs of Plymouth, as quoted in Prince's Chronology, says under the same date, in the year 1621: "We begin to sow our garden seeds." Had we fuller records on this subject, many more such instances might be brought to light.*

But unfortunately such observers as Smith and Holyoke, have been at all times rare, though there is every reason to hope, that they will be much more numerous in the present condition of the natural sciences. It may be safely asserted, however, that this idea of the gradual softening of our winters finds less and less support in proportion as we descend from general impressions to precise statistics. This is not the only alteration supposed to have occurred in our New England climate. It is a common impression, that our summer droughts are more frequent, and of longer continuance than formerly. If we could believe that there existed such a tendency in our climate, it would certainly be a most unwelcome conclusion. But the fact may be, not that these droughts are more severe than formerly, but that their effects have become of more consequence, and have been perceived in more ways by our present far more numerous and wide-spread population. To say nothing of these effects as exhibited on a wide extent of cultivated land,

* Macgregor, in his elaborate work on the Progress of America, Vol. 2, p. 42, observes, "That the Baron La Hontan, is recorded to have left Quebec, in 1690, on the 20th of November. He adds that this is as late as any vessel can or will leave that port at the present. Potrincourt and Champlain, on a Sunday, early in January, 1607, sailed in a boat six miles up to Port Royal, (Annapolis, Nova Scotia,) to visit a field of winter wheat, dined in the sunshine, enjoyed music in the open air, &c. No winter since has been milder."

they are rendered still more striking in the lowering of the streams which move our factories, and still more of the great rivers through which so much of our vast internal commerce is carried on. But, that droughts are in truth, more frequent and severe in any part of our country, at the present day, than a century ago, is a proposition for which we find no countenance in any statistics which have come down to us. Smith's Diary, is, on this point an important, if not unique document. Though it seems to stand alone, its testimony is as frequent and precise as could be desired in any reason, or as the case could well admit. Years are repeatedly noticed at short intervals, as marked by a want of seasonable rains, in language, which, though of necessity less precise than a modern register of temperature, is yet altogether distinct and unequivocal. No one can read the Diary attentively without a full conviction that long and severe droughts were a hundred years since, as now, the great trial of the patience and confidence of the New England farmer. Thus, we find such dry spells noticed as occurring in the following years, between 1743 and 1762, inclusive, a period of just twenty years, 1743, 1746, 1747, 1748, 1749, 1752, 1754, 1757, 1761, 1762, being ten years out of twenty.

As we have derived the greater portion of our agricultural knowledge from English writers, and almost all our cultivated plants from English gardeners, we can scarce avoid comparing at every step, our own climate with that of England, and on the slightest acquaintance with the subject, are struck with the great contrasts which exist between them. These are generally known, and may be stated briefly as follows:—

1. Much more rain falls, annually, in New England than in most parts of Great Britain,* though the impression of common observers is probably the reverse. This difference may be more precisely understood from the following comparison of the fall of rain in twelve months at Chiswick, near London,

* I say in most parts of England. We are told in a Prize Essay on the English climate, (published in the Journal of the Royal Agricultural Society, 1850,) that in some of the western counties, the mountainous district of Cumberland, for instance, fifty, a hundred, or even a hundred and twenty, inches of rain sometimes fall in the course of the year. As a general rule, nearly twice as much rain falls on the south-west part England as in the neighborhood of London.

taken from the registers of the Horticultural Society, and at Cambridge, Massachusetts, as stated from the American Almanac. I have selected, for the first statement, the year 1836, which seems to have been an uncommonly rainy year in England, and for the second, the twelve months from May, 1847, to May, 1848, merely changing the order of the months. Rain in inches and decimals.

	Chiswick, Eng.	Cambridge, Mass.
January,	2.01	2.88
February,	1.61	4.
March,	3.30	2.5
April,	2.88	1.2
May,	1.01	1.935
June,	1.66	5.491
July,	1.78	2.527
August,	1.97	5.215
September,	3.81	6.536
October,	3.62	1.444
November,	3.60	4.940
December,	1.48	4.370
	28.73	43.049

Yet nothing is more common than the remark that our climate is a drier and brighter one than that of England, and this is perfectly true. Their rains fall in moderate and drizzling showers, while ours are more violent, and are followed by fair and cloudless days. To this frequency of rainy days, and the great rarity of the blazing weather which we often experience during our summers, for weeks together, is England indebted for the deep emerald green of her verdure, which we should in vain strive to imitate. In return, our bright summer suns give us a striking advantage over England in the raising of fruit. The apple, pear, peach, cherry, and plum can be raised in the climate of New England, as far north as Boston, on standard trees. Artificial modes of training are, with very few exceptions, not considered as worth employing, while in a large portion of Great Britain, there is not one of those trees except the apple, which does not require, or at least will not amply

repay such artificial facilities. If Duhamel is right in his unqualified assertion, that fruit raised on standard trees is decidedly better than the same fruit raised in any other way, and his authority on the subject of fruit trees is of the highest order, the fruit of this country must surpass that of England in flavor as well as in abundance. Such seems to be the fact, so far as specimens of the fruits of the two countries have been compared, (though it must be admitted that such comparisons have not been very numerous or thorough,) and such is certainly a probable inference, if we admit the position, to say the least a plausible one, that the juices of all vegetable products derive their highest flavor from the rays of the sun.

2. The temperature of the winter in every part of England is unquestionably much higher than in Massachusetts. With some very rare exceptions, i. e.—about once in a generation, the zero of Fahrenheit may be considered as the minimum of the thermometer at London. In the year 1830, which seems to have been considered at that place as an average year, the mean temperature of the following months was:—

January, . .	31.75	February, . .	36.6
March, . . .	48.33	December, . .	35.49

The average temperature of the same months for forty-three years at Salem, Massachusetts, deduced by Dr. Hale from Dr. Holyoke's Observations, (Transactions Am. Academy, Vol. 1, New Series,) was as follows:—

January, . .	25.59	February, . .	27.75
March, . . .	35.38	December, . .	30.29

Thus we perceive that near London, the temperature of the coldest month of the year is barely below the freezing point. Accordingly, we learn that in England proper, the ground is often sufficiently open for ploughing during the whole year, an operation very rarely practicable in the vicinity of Boston during any portion of the months of January or February. As the year advances this difference of temperature in favor of England disappears, and in the month of May the average heat of the weather in the environs of London and of Boston, is nearly

the same, or about 56° Fahrenheit. In the summer months the excess of heat is on the side of New England, and that to a higher degree than may be generally supposed. Thus, in the summer of the year 1827, which I have selected as an unusually warm one in England, the average height of the thermometer at Chiswick was in June, 61.7, July, 67.7, August, 63.3, while, according to Dr. Hale, the average temperature of these months at Salem for forty-three years was, by Dr. Holyoke's Observations, June, 67.19, July, 72.49, August, 70.53. In September the excess of heat continued to be on the side of our own climate, and the thermometer generally stands on an average about 5° higher with us than at London, and in October the temperature of the environs of Boston and London is very nearly on a level, or at about 52° of Fahrenheit. In November the balance again inclines in favor of London, the average temperature there being about 43°, and that of our own November about 40°.

Thus it would seem that our autumnal temperature approximates much more nearly to that of England, than our vernal, since at the autumnal equinox, our temperature is probably a little the higher of the two, while the average, heat of the month of March, at Salem, is about 35°, and that of London may be safely estimated as between ten and twelve degrees higher. From the greater intenseness of our summer's heat and winter's cold, the earth, and consequently the atmosphere, recovers more slowly—so to speak—both from the one and the other, than in England. From this excess of heat in summer, and deficiency of it in winter in our climate over that of London, it may naturally be conjectured that the one is nearly a counterpoise to the other, and that the average heat of the whole year at London and Boston, and in their respective vicinities, is not very different. Such seems to be the fact, as nearly as such a fact can be ascertained; the average heat of the year at London being estimated at about 49° Fahrenheit, and that of Boston very nearly the same. It results from the greater coldness of our winters, that our spring begins, on an average, three or four weeks later than in the neighborhood of London, and those who quit England in March or April, and arrive in Boston after a passage of a month, sometimes find the vegetation in the one country, pre-

cisely at the point where they left it in the other. So thoroughly, as already stated, is the ground cooled by our severe frosts, that it requires the action of the sun for several weeks after the equinox, to call our trees into full life. But such is the heat of our May and June, that vegetation, when once fairly started, advances with rapid strides, and by the middle of June, our growing season is probably on a level with that of the south of England. We find that many of our fruit trees which blossom, generally speaking, two or three weeks later than those of the same description near London or Paris, ripen their fruit at about the same time. Thus, from observations made for several years near Cambridge, in England, it appears that cherry trees which flowered, on an average, April 14th, ripened their fruit June 27th—by no means an early period with us. All seasons, early and late, says the late Mr. Lowell, are nearly on a level, on the 10th of June. "It is familiar to every one, that in Russia and Canada, the seasons are as forward as ours, by the beginning of July." Midsummer probably occurs at precisely the same time throughout the whole of the northern temperate zone.

3. The most striking circumstances, however, which distinguish the climate of every part of our country from that of Great Britain, are our fierce extremes and the sudden and extensive changes of our temperature. The zero of Fahrenheit has been stated as the minimum of the thermometer at and near London. Putting out of the question, however, extraordinary seasons, this minimum may be fairly placed ten degrees higher. With the same qualification, the greatest degree of cold in the vicinity of Boston, may be fixed at about ten degrees below zero; being twenty degrees lower than the London minimum. This degree of cold is reached or approached in our vicinity almost every year.

We very rarely pass a winter which is not distinguished by a few days of extreme cold, by which is meant, days on which the mercury sinks below zero. The number of these days varies, rarely exceeding five or six, and averaging three in a season, and they often occur in immediate succession. Few as they are, they are amply sufficient to test the hardiness of our trees and shrubs, for it is not likely that any plant that could

endure two or three days of such weather, would sink under a longer continuance of it. This occasional degree of cold alone would be sufficient to deprive us of many of the shrubs which ornament the gardens of every part of England. But our winters would probably be far less dangerous to vegetable life if our climate, severe as it is, were more uniform. On the contrary, it deserves any other title. The average range of our thermometer in the three winter months of December, January and February, is not less than sixty degrees, while that of a London winter is less than forty, and the change in the course of one of our winter days, sometimes amounts to thirty degrees. The difference between the greatest degree of heat and cold in our spring months, (March, April, and May,) the most critical of the whole year, so far as vegetation is concerned, is not less, on an average, than seventy-four degrees. When these facts are considered, it will seem much more surprising that the list of exotics which habitually endure our winters should be so large as it is, than that we should be compelled to exclude from this list so many of the ornamental plants of Europe.

Our extremes of heat are equally striking as those of cold. They occur with equal suddenness, and with more frequency. The number of days in each year in which our thermometer rises above ninety degrees, a heat all but unknown in England, is not less on an average, than ten annually. These occurring as they do near midsummer, produce much less effect of a permanent kind upon vegetation, than days of extreme cold, and are of little moment to the farmer or gardener, except as they serve to increase our summer drought.

No country, however, is entirely exempted from these extraordinary visitations of severe and changeable seasons, which overleap the usual boundaries of heat and cold, and occurring as they do, once, perhaps, in a score of years, destroy in many instances the growth of a generation. Such a season occurred in England, in the winter of 1837, which, for the greatness and suddenness of its changes, might fairly be denominated a New England winter. This resemblance must give additional interest to any full and accurate account of its effects on the vegetable kingdom, and such an account has been

given by Professor Lindley, in the London Horticultural Transactions, Vol. 2, New Series.

Whether any winter as extraordinary, all things considered, has occurred in New England, we have no sufficient data for ascertaining. The cold summer of 1816, was, however, an instance of equally rare and extraordinary deviation from the usual course of our seasons, and if not unexampled, has certainly been since unparalleled. It is probable that every period of twenty or thirty years has exhibited, with a very few if any exceptions, all the varieties of which our seasons are susceptible. Much of this able paper of Professor Lindley, is, as might be expected, principally interesting to English gardeners, but there are some deductions which may be drawn from it of a more general character, and applicable to our own, or any other climate. Professor Lindley's statements go far to overthrow the position of Mr. Knight, that the English winters have softened during the last century. The thermometer is stated by Lindley to have sunk in many places of the counties of Kent and Middlesex from three to thirteen degrees below zero, and at Chiswick, it stood at $4\frac{1}{2}°$. Had Mr. Knight lived to that time, it can scarcely be doubted that he would have seen reason for a great, if not entire change in his impressions. There is, I believe, no instance on record of a degree of cold materially greater in the southern part of England. This paper clearly shows, or rather strikingly illustrates the fact, that extremes of temperature, *especially those which occur suddenly and last but a little while*, are often confined within very narrow local boundaries, and that the heat or cold of places within a very short distance of each other, may vary exceedingly at any given moment. The temperature of any spot is materially affected by large objects, natural or artificial, within the immediate vicinity, and so great effects are produced by the radiation of heat on the one hand, and by shelter on the other, that we often find thermometers in different parts of the same city or village, or even of the same garden, differing several degrees. Mr. Daniels states (Horticultural Transactions) that he has known a difference of thirty degrees of temperature between the top of a hill of moderate height, and the valley at the foot. Not the least interesting of the facts observed this

winter, says Lindley, was this: that in those places where the cold was very severe, the more plants were exposed, the less they suffered, while the more they were sheltered without being fully protected, the more extensively they were injured. Of this, he proceeds to give several striking instances. Had he experienced a few of our changeable winters, he would scarcely have thought the fact extraordinary. It seems to be a settled principle that all tender plants which can bear our winter weather at all, are safer in a northern exposure than any other; and that the winter's sun is, with respect to all those plants which are called half-hardy, far more dangerous than the winter frost.

It is impossible to read Lindley's Essay, without being convinced that much of the devastation which it commemorates, was owing, not to the actual severity of the cold alone, but to the fact that this cold was preceded by an uncommonly warm winter. The cold was certainly such as is rare in any part of England, but in all probability, as Lindley himself intimates, far from unprecedented. But the preceding weather had kept the fluids of the trees in activity, and the sudden check was sufficient to test their powers of endurance to the utmost. Lindley himself does not seem to adopt this conclusion, or, at least, to state it distinctly, but rather to consider the actual degree of cold as the prime and sufficient agent. Doubtless, there is a limit in every exotic to its power of enduring cold, however prepared by the previous state of the weather. But when we find that our hardy ash (*Fraxinus Americana*) was severely injured by a temperature of four and one-half degrees below zero; while with us it seldom passes a winter without experiencing this degree of cold, and is often called to meet one much more severe, it seems impossible to deny that no injury would have occurred, had not the tree been strongly and unnaturally excited by the previous warm weather.

On the subject of acclimating plants, that is of rendering a tender species hardy by repeated raisings from the seed, Professor Lindley's language is very decided on the negative side. Acclimating, says he, in the strict sense of the word, seems to be a chimera, and quotes the bean as a plant which has been raised from the seed in cold climates for centuries,

and is still tender. An individual plant, however, may unquestionably be brought by judicious protection to endure a climate very different from its own. I have seen two beautiful silver firs flourishing near Savannah, which for some years were regularly screened by close boarding from the summer's sun, till at length protection became unnecessary. This paper of Lindley's is one, which, for the precision and fullness of its statements, as well as the fairness of its reasoning, may serve as a model for records of Horticultural Observations. From many obvious causes, meteorological investigations can serve only to mislead, unless made extensively, repeatedly, and accurately. Thermometers, in this country at least, are seldom insulated with any care from surrounding objects, or protected from the direct or reflected rays of the sun; and it is only by comparing the statements of many careful observers, that we can arrive even at an approximation to an accurate idea of the temperature of a large district at any given time. Moreover, the observations of the meteorologist must, like those of the astronomer, be continued for ages, before we can hope to discover, to any considerable degree, the mysterious laws which regulate the distribution of heat and cold. To the practical farmer or gardener, indeed, it is of much less moment to discover the causes of the leading peculiarities of our climate than to obviate their effects. One or two suggestions to that effect will close this Essay. So far as respects heat and cold, a farmer has but little power over the fierce and sudden extremes of our season, beyond the limits of his frames and greenhouses. He can only protect a few favorite shrubs by covering, and choose a proper exposure for his fruit trees.

But there is one striking feature in our climate, the long spells of dry weather, to which allusion has already been made, and the effects of which, no exertions should be spared to alleviate. One of the most obvious remedies would be irrigation. But very few of our farmers have the means at hand for watering their land upon any regular system, to say nothing of the high cost of the labor necessary to apply those means.

Another expedient, which has been little practised hitherto, but which seems fast coming into general use, is the breaking up of the soil to a great depth, more especially by subsoil

ploughing. In countries where labor is cheaper, the same object is effected by the spade, which indeed not only divides the under soil, but brings it to the surface. But the expense of this course, which in Massachusetts would probably be not less than fifty dollars per acre, would be considered by many as an insuperable objection. Besides, if the under soil is brought to the surface, a heavy expense must be incurred in addition, in the manure necessary to enrich it. The same objections may be made to the enormous trench ploughs, used in England, but, it is believed, scarcely known here, which completely reverse the soil to the depth of a foot and a half, and thus place the cold and barren subsoil uppermost. The only subsoil ploughs used with us are those which merely split and break up the hard pan beneath, and thus produce a bed of light earth of about sixteen to eighteen inches in depth. This can be effected in the stiffest soil by a subsoil plough, with four stout horses, or an equivalent force of oxen following in the wake of a common plough, and the cost will not exceed twelve or fourteen dollars per acre. When once done, it may be considered as permanent. Every one knows that the hardest ground, when fairly broken up, is loosened for many years, and nothing but the constant travel which takes place in the most frequented streets or roads can restore it to its former compactness for a long period. By this opening of the under soil, the roots of plants are enabled to shoot downward, and this they will infallibly do when the surface is parched by drought. Besides, every one knows that a heap of loose earth conducts the heat of the sun off much more slowly than a compact mass of hard soil, to say nothing of the superior power which it probably exerts in extracting from the atmosphere its hidden moisture. If we thus open a refuge to our plants from the fierce rays of the sun, we shall find that none, whether trees, shrubs, grain, or grass, will fail to shoot down their roots, as far as they find the way open.

The next expedient for alleviating the effects of our wearisome spells of dry summer weather is, mulching. This expedient can be practised to much less extent than that just mentioned, and must be a resort, rather of the gardener than the farmer. With crops of English grain, it is manifestly impossi-

ble, and for field culture, generally impracticable from its expense. But so far as a farmer is a raiser of trees, it may be of the greatest service. Young trees especially, are not only benefited, but often actually saved, by a cover of leaves or litter of moderate thickness placed round the foot to the distance of a few feet. The roots of the tree are thus effectually shielded, and enabled and invited to spread themselves in the soil near the surface, which is of course the richest. If we go into a forest or grove, and sweep away the bed of leaves which we find lying round the trunk of a tree, we shall generally find many of the roots actually lying on the top of the ground.

A third expedient, and perhaps the most effectual and useful for obviating the effects of drought, is the frequent stirring of the surface soil. This can never be done without essential benefit. It would be going quite too far to say that it completely supplies the want of rain, but it is certain, that in some way or other it produces effects which no one would suppose beforehand, and which no one who has ever attempted to test the point by experiment, will ever question. Whoever stirs a few feet of dry soil, will find that it soon changes color and gathers moisture from whatever source, or in whatever mode. Wherever this measure can be resorted to, which is of course only in places where the plough or hoe can be used, it will be found far more effectual than any other remedy which can be applied with the same amount of labor. The latest and most popular French writer on Horticulture points out the mulching and stirring of the soil as the two leading remedies against the droughts which visit all parts of the globe frequently, and our own country in a preëminent degree.

As no human power can change our climate, and as there seems no prospect of any amelioration of its severe winters or its parching droughts, it is an obvious dictate of common sense, to select such plants for cultivation, whether annual or perennial, as can best resist its fierce extremes. On this point, little or no information can now be given to New England cultivators. The experience of two centuries has rendered any precepts unnecessary, and our great agricultural staples are precisely those, which, if the choice were now to be made, a wise cultivator would select at the present day. Of these, the best adapted

to our climate, as well as our wants, is Indian corn. A few bushels of this grain which had been stored away by the natives, and were found by the Pilgrims before they landed on Plymouth Rock, may be called the first fruits of their new land of promise. Since then, the various merits of this most useful as well as beautiful plant have ever been most justly and wisely appreciated, and the twinkling maize field, as it has been elegantly called by Bryant, has always formed the most striking feature in our field cultivation. Another of our best native poets denominates this vegetable:

> The plumed maize with shapely blade,
> That stands like martial host arrayed.

And certainly no plant of the grain kind stands up more manfully under our fierce summer heats. It only begins to wilt when all our other crops have drooped, and the curling of its thick and glossy leaves, is a symptom of a drought of the last degree of severity. For a century and a half, its grain was our chief bread corn, and though now less in use as sustenance directly for ourselves, it furnishes us with much of our food, as the best grain for fattening animals yet known. But we have only begun to appreciate the value of this plant in another particular, namely, as green fodder.

Its worth, in this respect, was first brought into notice by the late Col. Pickering, who states that it will yield for this purpose more than ten tons of green food per acre. Still further information on the subject may be found in the valuable pamphlet on soiling, lately republished by President Quincy.* When our grass is actually burned up by the dry weather, in other words, in half our summers at least, this plant furnishes a complete substitute to our grazing animals who prefer it to any other food, and in all cases, whether the cattle are fed in the barn or the field, forms a valuable addition which well repays the labor bestowed in raising and reaping it. I cannot leave the subject of our New England climate without a word upon its favorable influence on the health of our domesticated animals.

* President Quincy states, p. 5, that two square rods of land will afford an ample supply of green food per day for each head of cattle, without any additional food. He recommends sowing in drills at the rate of three bushels per acre.

Our severe cold, which penetrates to our very firesides, has compelled us, from the beginning, to house those animals in the winter, while they, doubtless, suffer much in other countries where the winters are sufficiently mild to allow them to be exposed unsheltered without absolute cruelty, and yet not mild enough to enable them to bear such exposure comfortably. The practice, so general in England, for instance, of permitting cattle to remain out during the whole of the year, is justly censured by that eminent agriculturist, our late countryman, Dr. Colman, as a most slovenly and unthrifty one. In our dry summers too, our sheep and neat cattle seem in a great degree exempt from many diseases which prevail in England, and are ascribed principally to the damp weather. We accordingly find that a race of cattle has grown up among us which, though a very moderate degree of attention has been paid to them on the whole, is highly distinguished by its valuable qualities in every essential particular; and although the importation of valuable foreign animals should by no means be discouraged, it is far from certain that the best mode of improving our domestic cattle is not by careful selections from our own stock. Our New England climate, like every other climate on the globe, often calls forth complaint and criticism from those who live under it; but when we give it due credit for the great variety and importance of the vegetable productions, whether grain or fruit, which can be raised in the greater portion of the States of New England, and for its proverbial healthiness, as respects our farming stock, to say nothing of its far more important effects in invigorating our farming population, we shall probably allow that it abundantly compensates us, even in an agricultural point of view, for its violent changes, nipping winters and parching droughts.

APPENDIX.

RETURNS OF AGRICULTURAL SOCIETIES FOR 1853.

FINANCES.

SOCIETIES.	Amount received from the Commonwealth for the yr.	Income of the Fund.	New Members and Donations.	All other sources.	Whole Amount of Receipts for the year.	Amount of Premiums and Gratuities Distributed.	Current expenses of the Society for the year.	Whole amount of Disbursements for the year.	Value of Real Estate belonging to the Society.	Amount of the Permanent Fund (par value.)	Total Amount of all the property of the Society.
Mass. Society for Promoting Agriculture, .	$600 00	$1,845 40	–	$196 00	$2,641 40	–	–	–	–	23,500 00	$23,500 00
Essex Society, .	600 00	527 52	$169 00	631 67	1,928 19	$580 50	$666 13	$1,246 63	–	9,363 66	10,583 66
Middlesex Society,	600 00	175 00	1,500 00	325 00	2,600 00	663 50	500 00	2,600 00	$2,000 00	3,000 00	5,000 00
Worcester Society,	600 00	778 80	140 00	682 18	2,200 98	599 00	552 90	1,143 90	5,964 00	7,730 00	13,694 00
Worcester West,	600 00	190 50	54 00	–	844 50	495 75	188 28	684 03	–	3,175 00	3,175 00
Worcester North,	–	66 00	1,479 00	1,058 00	2,603 00	359 00	116 00	475 00	–	2,128 00	2,128 00
Hamps're, Franklin & Hampden Society, .	600 00	389 26	95 00	169 26	1,253 52	517 20	856 03	1,373 23	–	8,141 29	8,480 06
Hampshire Society,	600 00	180 72	237 50	–	1,018 22	500 10	390 00	890 00	–	3,255 26	3,255 26

Hampden Society, .	600 00	188 19	102 50	404 69	1,295 38	417 38	684 39	1,150 02	–	4,860 00	5,300 00
Franklin Society, .	600 00	174 62	614 50	197 25	1,586 37	388 41	522 04	–	–	3,768 00	3,768 00
Berkshire Society, .	600 00	109 00	37 00	120 00	866 00	665 60	298 00	963 60	–	3,000 00	3,500 00
Housatonic Society,	600 00	320 00	27 00	38 60	985 60	865 00	252 65	1,117 65	–	6,335 33	6,335 33
Norfolk Society, .	600 00	138 00	1,532 00	4,398 80	6,668 80	572 00	5,557 95	6,129 95	6,129 89	–	6,129 89
Bristol Society, .	600 00	200 60	319 00	550 53	1,670 13	756 25	481 98	1,238 23	–	3,240 00	3,671 90
Plymouth Society, .	600 00	647 82	60 00	296 31	1,604 13	886 00	402 52	2,597 52	–	9,550 00	9,650 00
Barnstable Society,	382 00	93 60	10 00	–	485 60	223 42	181 19	404 61	–	1,740 00	1,740 00
Total, . .	8,782 00	6,025 03	6,376 50	9,068 29	30,251 82	8,489 11	11,650 06	21,014 37	14,093 89	92,816 54	109,911 10

PERMANENT FUND—HOW INVESTED.

Massachusetts Society for Promoting Agriculture.—Stock of Boston Banks.

Essex Society.—In Bank Stocks, bonds, and notes, secured by mortgages. Personal property belonging to Society, $1,220.

Middlesex Society.—Stocks of banks, and railroads, and notes, and mortgages.

Worcester Society.—In bank stock, notes and mortgages.

Worcester West Society.—In notes of hand and cattle pens.

Worcester North Society.—Notes of hand, cattle pens, and implements for use of Society.

Hampshire, Franklin and Hampden Society.—Notes secured by mortgages and personal securities.

Hampshire Society.—Loans at interest on real estate security $2,380; loans at interest on personal security, 300; life members' notes on interest, 512 33; cash on hand, 62 93.

Hampden Society—In notes of hand, in various sums, mostly secured by mortgages on real estate.

Franklin Society.—Notes secured by mortgages on real estate and personal securities.

Berkshire Society.—In loans on personal security.

Housatonic Society.—Notes, annual interest. Each member gives his note for $16 67, with interest annually. These notes constitute the fund.

Norfolk Society.—In land, agricultural hall, cattle pens, fixtures, furniture, &c., at cost.

Bristol Society.—12 shares Taunton Bank, $1,200; promissory notes of the County of Bristol, 1,640; Crocker, Brothers & Co., 400; cash on hand, 431 90.

Plymouth Society.—7 promissory notes, $5,450; 2 bonds Cape Cod Branch Railroad, $700; 31 shares Plymouth Bank, 3,100; 3 shares Bank of North America, 300; pens and fixtures, 100.

Barnstable Society.—In notes of hand, of sundry persons—all of which are considered good, $1,680; In Barnstable Savings Institution, 60.

RETURNS OF AGRICULTURAL SOCIETIES FOR 1853.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.

FOR FARMS, &c.

SOCIETIES.	For management of Farms.	For Draining.	For Ploughing.	For Subsoil Ploughing.	For Reclaiming Meadow Land.	For Manures and experiments with them.	For Orchards of all kinds.	For other Farm Improvements.	Total amount awarded for Farm Improvements.
Massachusetts Society for Promoting Agriculture,	–	–	–	–	–	–	–	–	–
Essex Society,	$20 00	–	$110 00	–	$25 00	–	–	$171 00	$326 00
Middlesex Society,	52 00	–	94 00	–	20 00	–	$43 00	15 00	224 00
Worcester Society,	–	–	–	–	15 00	–	–	15 00	30 00
Worcester West Society,	15 00	–	36 00	–	–	10 00	–	2 00	63 00
Worcester North Society,	–	–	23 00	–	–	–	–	–	23 00
Hampshire, Franklin & Hampden Society,	70 00	–	59 00	–	10 00	–	12 00	–	151 00

Hampshire Society, . .	45 00	–	32 00	–	14 00	16 00	22 00	–	129 00
Hampden Society,. . .	35 00	–	–	–	6 00	–	24 00	–	65 00
Franklin Society, . . .	–	–	27 00	3 00	–	–	–	–	30 00
Berkshire Society, . . .	–	–	54 00	–	–	–	15 00	–	69 00
Housatonic Society, . .	–	–	70 00	30 00	–	–	–	–	100 00
Norfolk Society, . . .	25 00	–	85 00	–	–	–	15 00	36 00	161 00
Bristol Society, . . .	15 00	–	73 00	–	–	–	–	–	88 00
Plymouth Society, . . .	–	–	49 00	4 00	–	38 00	–	–	91 00
Barnstable Society, . .	–	–	14 00	–	6 00	–	–	4 00	24 00
Total, ...	$277 00	–	$726 00	$7 00	$126 00	$64 00	$131 00	$243 00	$1,574 00

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED—Continued.

FOR FARM STOCK.

SOCIETIES.	Bulls.	Working Oxen.	Milch Cows.	Heifers and Calves.	Fat Cattle.	Horses.	Swine.	Sheep.	Poultry.	All other Stock.	Total amount awarded for Live Stock.
Massachusetts Society for Promoting Agriculture,	–	–	–	–	–	–	–	–	–	–	–
Essex Society,	$21 00	$28 00	$19 00	$22 41	$20 32	$65 36	$25 00	$11 00	$27 00	$38 00	$286 12
Middlesex Society,	45 00	20 00	62 00	30 00	18 00	23 00	20 00	–	13 00	14 00	245 00
Worcester Society,	43 00	46 00	50 00	59 00	55 00	34 00	35 00	14 00	23 00	63 00	422 00
Worcester West Society,	29 00	35 00	27 00	40 00	45 00	35 00	34 00	10 00	11 00	29 00	295 00
Worcester North Society,	20 00	14 00	12 00	22 00	30 00	15 00	31 50	4 50	7 00	28 50	184 50
Hampshire, Franklin & Hampden Society,	23 00	110 00	28 00	25 00	31 00	89 00	24 00	8 00	38 50	41 00	420 50
Hampshire Society,	6 00	54 00	12 00	15 00	17 00	41 00	13 00	9 00	6 00	18 00	191 00
Hampden Society,	27 00	96 00	20 00	16 00	51 00	64 50	40 00	19 00	10 00	27 00	370 50

Franklin Society, . . .	25 00	27 00	33 00	6 50	35 00	54 00	21 00	29 00	5 25	29 00	264 75
Berkshire Society, . . .	22 00	98 00	66 00	16 00	–	66 00	26 00	72 00	20 00	–	386 00
Housatonic Society, . .	28 00	62 00	42 00	34 00	13 00	61 00	23 00	50 00	6 00	42 00	361 00
Norfolk Society, . . .	18 00	26 00	75 00	53 00	5 00	53 00	49 00	–	41 00	7 00	320 00
Bristol Society, . . .	38 00	55 00	43 00	24 00	18 00	71 00	21 00	17 00	26 00	25 00	338 00
Plymouth Society, . . .	21 00	33 00	23 00	30 00	35 00	32 00	24 00	–	20 00	19 00	237 00
Barnstable Society, . . .	15 00	23 00	14 00	6 00	14 00	18 00	27 00	3 00	–	–	120 00
Total, ...	381 00	727 00	526 00	398 44	396 32	721 86	413 00	246 50	253 75	383 50	4,451 37

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED—Continued.

FOR FARM PRODUCTS.

SOCIETIES.	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Any other Grain Crops.	Grass Crops.	Potatoes.	Carrots.	Beets.	Turnips.	Other Root Crops.	Total amount awarded for Grain and Root Crops.	Broomcorn.	Any other cultivated crops.	Fruits and Flowers.	Milk.	Butter and Cheese.
Mass. Society for Promoting Agriculture,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Essex Society,	$12 00	–	$6 00	–	–	$6 00	–	–	$6 00	–	–	$6 00	$36 00	–	specim's of veg's. $30 00	$68 50	–	24 00
Middlesex Society,	15 00	–	–	–	–	–	–	–	9 00	–	–	–	24 00	–	28 00	69 00	Bread, $24 00	–
Worcester Society,	–	–	–	–	–	–	–	–	11 00	–	–	–	11 00	–	–	–	–	64 00
Worcester W. Soc'y,	10 00	–	3 00	–	–	–	–	$8 00	9 00	–	–	3 00	33 00	–	–	17 00	–	42 00
Worc'ter N. Soc'y,	12 00	6 00	5 00	–	–	–	–	5 11	5 37	$2 00	$0 25	74	36 47	–	8 61	35 11	–	11 00
Hamps're, Franklin & Hampden Society,	10 00	–	–	–	–	–	5 00	–	–	–	–	–	15 00	–	11 50	23 00	B'd & Flour 11 00	27 00
Hampshire Society,	12 00	7 00	9 00	–	–	–	3 00	–	3 00	–	2 00	50	36 50	3 00	–	17 75	–	22 50

Hampden Society, .	5 00	8 00	–	–	–	–	–	2 75	–	75	2 25	50	19 25	–	21 75	29 00	–	23 50
Franklin Society,* .	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1 50	14 75	–	9 00
Berkshire Society, .	45 00	38 00	16 00	16 00	16 00	35 00	–	14 00	6 00	–	6 00	–	192 00	–	–	28 00	–	28 00
Housatonic Society,	49 00	31 00	20 00	5 00	22 00	26 00	9 00	–	6 00	–	–	–	168 00	–	3 00	61 00	–	42 00
Norfolk Society, .	24 00	6 00	4 00	4 00	–	–	–	–	–	–	–	–	–	–	32 00	60 00	10 00	45 00
Bristol Society, .	10 00	–	–	–	–	–	–	–	10 00	–	–	–	20 00	–	31 75	107 00	Honey B'd. 56 00	–
Plymouth Society, .	63 00	19 00	–	5 00	14 00	–	–	–	14 00	8 00	3 00	5 00	131 00	–	33 00	75 00	–	50 00
Barnstable Society, .	–	3 00	–	–	–	–	–	50	3 50	75	–	–	7 75	–	11 25	11 75	–	5 00
Total, . . .	267 00	118 00	63 00	30 00	42 00	67 00	17 00	30 36	82 87	11 50	13 50	15 74	729 97	3 00	212 36	616 86	101 00	393 00

* "The Committee on Grain and Root Crops have not returned their Reports."

RETURNS OF AGRICULTURAL SOCIETIES FOR 1853.

MISCELLANEOUS.

SOCIETIES.	Amount awarded for Agricultural Implements.	Amount awarded for all other Agricultural objects.	Amount awarded for objects other than Agricultural.	No. of Persons who received Premiums and Gratuities for Agricultural objects.
Massachusetts Society for Promoting Agriculture, .	–	–	–	–
Essex Society, . . .	–	–	$111 50	147
Middlesex Society, . .	$12 00	–	37 50	125
Worcester Society, . .	–	$69 00	–	74
Worcester West Society, .	11 00	–	34 75	66
Worcester North Society, .	1 00	1 00	58 95	103
Hampshire, Franklin and Hampden Society, . .	17 00	–	154 25	184
Hampshire Society, . .	14 50	33 75	41 85	213
Hampden Society, . .	21 00	3 50	132 50	116
Franklin Society, . .	1 00	–	50 75	200
Berkshire Society, . .	14 00	–	96 00	150
Housatonic Society, . .	5 00	7 00	118 00	228
Norfolk Society, . . .	21 00	10 00	51 00	67
Bristol Society, . . .	–	–	115 50	239
Plymouth Society, . .	–	617 00	269 00	136
Barnstable Society, . .	3 00	–	40 67	47
Total, ...	$129 50	$741 25	$1,312 22	2,095

Names of Towns and Cities in which Premiums and Gratuities for agricultural objects were distributed, and Amount to each.

MASSACHUSETTS SOCIETY FOR PROMOTING AGRICULTURE.

Amount paid to Dr. Slade, for a course of Lectures on the Horse,	$600 00
Paid Thomas Motley, Jr., Esq., for care and keep of the Society's Alderney Stock,	460 74
Paid for Premiums to the Treasurer of the National Exhibition of Horses, at Springfield,	250 00
Miscellaneous,	45 62
Total,	$1,356 36

ESSEX SOCIETY.

Andover,	$209 47	Lawrence,	$118 50
Newbury,	88 26	Lynn,	5 50
West Newbury,	22 50	Middleton,	14 50
Danvers,	185 50	Salem,	38 50
Georgetown,	34 50	Lynnfield,	50
Marblehead,	18 50	Boxford,	7 44
Bradford,	29 20	Wenham,	3 00
Methuen,	47 00	Newburyport,	7 00
Topsfield,	14 50	Amesbury,	50
Groveland,	13 00	Rowley,	5 00
Haverhill,	8 50		
Beverly,	10 75	Total,	$882 12

MIDDLESEX SOCIETY.

Ashby,	$8 00	Melrose,	$50 00
Acton,	29 50	Pepperell,	2 00
Bedford,	6 00	Shirley,	6 50
Boxboro',	4 00	Sudbury,	19 00
Cambridge,	13 00	Tewksbury,	10 50
Chelmsford,	10 50	Waltham,	25 00
Concord,	191 00	Watertown,	8 00
Dracut,	11 00	Wayland,	20 50
Framingham,	36 50	West Cambridge,	5 00
Lexington,	24 50	Weston,	1 00
Lincoln,	22 50	Wilmington,	44 00
Lowell,	34 00	Total,	$589 00
Marlboro',	7 00		

WORCESTER SOCIETY.

Auburn,	$36 00	Princeton,	$52 00
Barre,	99 00	Shrewsbury,	17 00
Boylston,	10 00	Southboro',	18 00
Charlton,	24 00	Sterling,	4 00
Grafton,	39 00	Sturbridge,	19 00
Holden,	25 00	Sutton,	46 00
Leicester,	14 00	Templeton,	4 00
Millbury,	4 00	Warren,	8 00
New Braintree,	25 00	West Boylston,	18 00
Northboro,'	13 00	Westboro',	20 00
Oakham,	6 00	Worcester,	74 00
Oxford,	16 00	Total,	$591 00

WORCESTER WEST SOCIETY.

Barre,	$253 00	North Brookfield,	$12 00
Hardwick,	45 00	Templeton,	10 00
New Braintree,	44 00	Hubbardston,	10 00
Petersham,	38 00	Oakham,	6 00
Princeton,	21 00	Dana,	4 00
Phillipston,	14 00	Total,	$457 00

WORCESTER NORTH SOCIETY.

Fitchburg,	$139 09	Winchendon,	$1 50
Princeton,	52 25	Sterling,	10 00
Royalston,	15 00	Leominster,	2 50
Westminster,	32 99	Ashby,	23 00
Phillipston,	15 00	Total,	$298 70
Ashburnham,	7 37		

HAMPSHIRE, FRANKLIN AND HAMPDEN SOCIETY.

Northampton,	$199 40	Conway,	$8 00
Hadley,	149 00	Chesterfield,	25 00
South Hadley,	51 00	Norwich,	16 00
Hatfield,	54 50	Whately,	21 00
Southampton,	34 00	Williamsburg,	6 00
Easthampton,	8 00	Cummington,	10 00
Goshen,	6 00	Amherst,	15 00
Belchertown,	9 00	Sunderland,	8 00
Granby,	23 00	Total,	$663 90
Deerfield,	21 00		

HAMPSHIRE SOCIETY.

Amherst,	$136 74	Montague,	$1 00
Belchertown,	8 00	New Salem,	6 25
Boston,	2 00	Northampton,	14 37
Conway,	2 00	Pelham,	11 50
Cummington,	5 00	Prescott,	7 00
Deerfield,	37 00	Shutesbury,	2 00
Easthampton,	2 00	South Hadley,	14 00
Enfield,	5 00	Sunderland,	113 00
Granby,	15 00	Wendell,	1 00
Hadley,	97 24	Williamsburg,	3 00
Hatfield,	4 00	Total,	$500
Leverett,	13 00		

HAMPDEN SOCIETY.

Springfield,	$245 75	Chicopee,	$37 00
West Springfield,	130 50	Southwick,	18 50
Wilbraham,	57 75	Montgomery,	3 00
Longmeadow,	54 25	Total,	$598 75
Westfield,	52 00		

FRANKLIN SOCIETY.

Greenfield,	$68 25	Coleraine,	$4 50
Deerfield,	59 87	Heath,	4 00
Conway,	18 47	Rowe,	1 00
Shelburne,	128 25	Leyden,	8 00

FRANKLIN SOCIETY—Continued.

Bernardston,	$9 00	Shutesbury,	$5 00
Gill,	14 25	Montague,	29 50
Northfield,	20 52	Sunderland,	11 80
Warwick,	3 00	Total,	$388 41
Orange,	3 00		

BERKSHIRE SOCIETY.

Adams,	$13 00	Lenox,	$90 00
Williamstown,	22 00	Stockbridge,	38 00
Cheshire,	11 00	West Stockbridge,	25 00
Lanesboro',	94 00	Great Barrington,	75 00
New Ashford,	3 00	Egremont,	21 00
Hancock,	5 00	Monterey,	8 00
Richmond,	41 00	Sheffield,	45 00
Dalton,	15 00	West Marlboro',	1 00
Windsor,	2 00	Becket,	13 00
Hinsdale,	15 00	——,	12 00
Pittsfield,	242 00	Total,	$813 00
Lee,	22 00		

HOUSATONIC SOCIETY.

Great Barrington,	$220 00	Richmond,	$34 00
Sheffield,	170 00	Lee,	22 00
Egremont,	164 00	Alford,	19 00
Monterey,	51 00	Westfield,	5 00
West Stockbridge,	48 00	Sandisfield,	3 00
Lenox,	44 00	Pittsfield,	3 00
New Marlborough,	40 00	Salisbury, (Connecticut,)	2 00
Stockbridge,	40 00	Total,	$865 00

NORFOLK SOCIETY.

Bellingham,	$2 00	Quincy,	$16 00
Braintree,	56 00	Roxbury,	12 50
Canton,	21 00	West Roxbury,	100 00
Dedham,	97 00	Sharon,	3 00
Dorchester,	96 00	Stoughton,	7 00
Dover,	41 00	Walpole,	22 00
Medway,	45 00	Wrentham,	23 00
Medfield,	66 00	Cambridge and non-residents,	3 00
Milton,	74 50		
Needham,	64 00	Total,	$749 00

BRISTOL SOCIETY.

Attleboro',	$45 00	Norton,	$85 00
Berkley,	20 25	Rehoboth,	22 75
Dighton,	8 00	Raynham,	88 50
Easton,	8 00	Seekonk,	14 50
Fairhaven,	12 00	Somerset,	24 00
Fall River,	10 00	Taunton,	249 75
Mansfield,	32 50		
New Bedford,	20 50	Total,	$640 75

PLYMOUTH SOCIETY.

Abington,	$2 50	Hanson,	$13 00
Bridgewater,	236 00	Marshfield,	3 50
Carver,	19 00	North Bridgewater,	13 75
East Bridgewater,	45 50	Duxbury,	23 00
Halifax,	20 00	Kingston,	3 25

PLYMOUTH SOCIETY—CONTINUED.

Lakeville,	$10 00	Rochester,	$0 50
Middleborough,	80 75	Wareham,	7 00
Pembroke,	32 00	West Bridgewater,	72 00
Plympton,	10 00	Total,	$597 75
Plymouth,	6 00		

BARNSTABLE SOCIETY.

Barnstable,	$116 25	Chatham,	$6 00
Sandwich,	11 50	Orleans,	3 00
Yarmouth,	42 00	Total,	$182 75
Dennis,	4 00		

NOTE. An error occurs in the statement on page 116, of the aggregate income of the fund of the societies. It should read $6,025.03; while the aggregate receipts on the same page should read $30,251.82. An error discovered in the returns, makes this correction necessary.

The foregoing Tables are made up of the original returns. Owing to a slight misconception of the blanks furnished to the officers of the societies, two or three instances occur in which expenditures are placed under the wrong heads, as for instance, on page 168, under the head of Ploughing, the Worcester Society awarded $58 at the ploughing match, which appears in another part of the returns.

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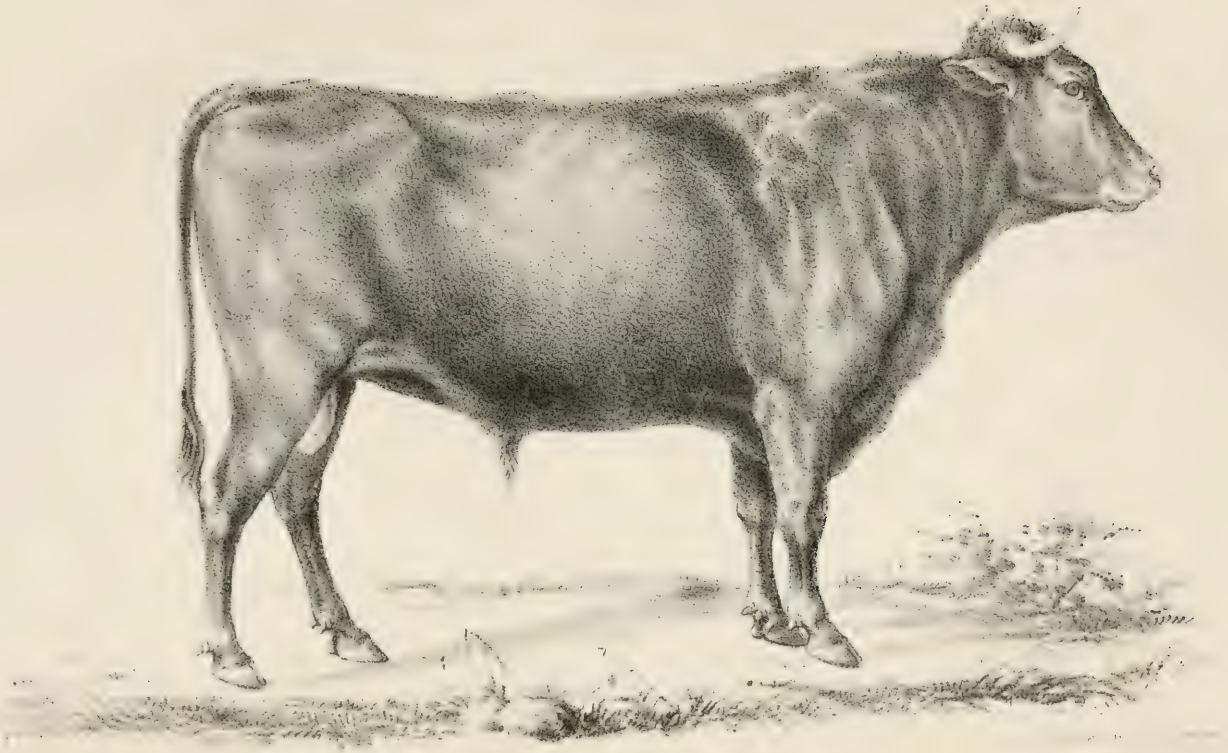

FIRST PRIZE DEVON EARL OF LEICESTER

The Property of Nathaniel Paige Esq. Surrey

THE

AGRICULTURE OF MASSACHUSETTS,

AS

SHOWN IN RETURNS

OF THE

AGRICULTURAL SOCIETIES,

1853.

PREPARED BY

CHARLES L. FLINT,

Secretary of the Board of Agriculture.

BOSTON:

WILLIAM WHITE, PRINTER TO THE STATE.

1854.

PREFACE.

The materials of which the present volume is composed are of unusual value, and the societies were probably never in a more flourishing condition than at present, all but four having published their Transactions.

The distribution of its volume of Transactions is one of the most efficient means which a County Society has of awakening an interest in the subject of Agriculture. One great object of such society, with the aid of the bounty of the Commonwealth, should be to create an interest where but little exists, and no society can attain its highest usefulness, which has not vitality enough to publish, and to obtain a general distribution of its proceedings. It is believed that the expense of publication would be both judicious and economical, even if its Transactions should be placed in the hands of every farmer in the county, whether a member of the society or not. It is wholly impossible to give any society the credit and position in this volume which it may deserve, unless its returns are properly made.

My thanks are due to the State Society and to the individuals who have kindly furnished me, at their own

expense, with the plates of valuable animals which adorn this volume. It is desirable that all first prize animals should appear here. An accurate likeness gives a far better idea of a good animal than any description can.

The arrangement of this volume is somewhat different from that of any which has preceded it, and it is thought that this, together with the complete index at the end, will make it more valuable and convenient for reference.

The financial returns of the societies will be found in the Appendix to the First Annual Report of the Secretary of the Board of Agriculture.

C. L. FLINT.

Boston, April, 1854.

OFFICERS OF AGRICULTURAL SOCIETIES FOR 1854.

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President—CHARLES MARSTON, of Barnstable.
Secretary—GEORGE MARSTON, of Barnstable.

EXHIBITIONS FOR 1854.

Essex,	September	27 & 28.
Middlesex,	October	4 & 5.
Worcester,	September	27 & 28.
Worcester West,	"	27.
Worcester North,	"	13.
Hampshire, Franklin and Hampden,		
Hampshire,	October	18 & 19.
Hampden,	September	27 & 28.
Franklin,	October	4 & 5.
Berkshire,	"	4 & 5.
Housatonic,	September	27 & 28.
Norfolk,	"	26 & 27.
Bristol,	"	27 & 28.
Plymouth,	October	4 & 5.
Barnstable,	"	11.

AGRICULTURE OF MASSACHUSETTS.

FARMS.

The committee of the Norfolk Society suggest the propriety of adopting some known standard of judgment to be used by committees on farms. The following is suggested by them as worthy of notice:—

Requisites and Evidences of Good Farming.

1st. A good soil, well tilled, and kept free of various weeds, both on the fields and the roads.

2d. Lots well fenced, and suited in number to the size of the farm.

3d. Substantial and convenient barns and stables of sufficient dimensions to contain the produce of the farm, and to comfortably house the cattle kept on it.

4th. A judiciously arranged dwelling, in neat condition, with a well and filtering cistern.

5th. Convenient buildings to facilitate the economical management of the farm; among which may be enumerated a wood-house, a wagon and tool-house, a workshop, a granary and corn-house, a convenient piggery, an ice-house, ash and smoke-house, all secured against decay by being well raised from the ground and neatly painted or whitewashed.

6th. Convenient yards attached to the barns and stables, so arranged as to prevent waste of the liquid manure, well sheltered from the blasts of winter, and provided with water for the cattle.

7th. Door yards laid with grass and flower-beds, and shaded by ornamental trees, indicating to the passer-by the dwelling of taste, health and comfort.

8th. A kitchen garden highly cultivated, and containing every species of vegetable that can be raised in our climate, with strawberry and asparagus beds.

9th. A fruit garden or orchard, where choice apples, cherries and plums are carefully cultivated, and where can be found neat rows of raspberry, gooseberry, blackberry and currant bushes.

It will be seen, also, that the propriety of increasing the amount of the premiums on farms, and extending the entries over a term of years, during which the whole operations of the farm would be under the inspection of the committee, is strongly impressed upon the attention of societies.

ESSEX.

The committee would suggest to the trustees the expediency of revising the mode of offering premiums on farms; and they beg leave to propose the plan of entering farms for a period of not less than three years, to be viewed, as now, twice each year, and the first premium to be $100, and the second, $50. To your committee it does seem important that some revised mode should be adopted, which it may be hoped will increase the number and grade of farms offered for the society's premiums.

RICHARD P. WATERS, *Chairman.*

Josiah Crosby's Statement.

In calling your attention to my farm, I feel some reluctance, in consequence of the very prevalent idea among farmers, that none but large and decidedly model farms should be considered worthy of a premium. But notwithstanding this opinion, experience and observation have taught me that small farms declare the largest relative dividends; and in corroboration of this statement, I could, if my limits would permit, cite many instances of farms in this county, containing ten or twelve acres,

that are made to produce annually a larger net income than others containing one hundred acres.

In conformity with these views, I have ventured to offer my humble farm for a premium, destitute as it is of all such pleasing associations as "paternal acres," "ancestral oaks," or "venerable mansions," handed down from former generations; and I present my claim only upon the ground that he is a benefactor who makes two blades of grass to grow, where but one grew before. I will endeavor briefly to convince you that this much I have done.

I purchased my farm in the spring of 1841; it then contained about thirty acres, one-half of which was completely covered with bushes. My first move was to commence an open warfare upon these "cumberers of the ground." For a while, they resisted manfully, and seemed to bid defiance to our attacks; but after a hard-fought battle, we found ourselves at last in full possession of the field. This field is now the best part of my farm, and is capable of producing two tons of English hay to the acre; but at the time I commenced work upon it, it would not have afforded subsistence for a solitary cow.

The other half of the farm at the time of my purchase, was a strong and rich, but cold soil, and for want of sufficient draining and manuring, it produced but scanty crops. It has been partially drained and had a liberal supply of manure. It is now in a good state of cultivation, and produces large crops, but is yet susceptible of great improvement.

I have made several additions to my first purchase, and the farm now contains about sixty acres, all of which—with the exception of sixteen acres of woodland—is in a high state of fertility, and with a little additional draining and manuring, will compare favorably with any similar number of acres in the county.

I have built a barn and cellar fifty-six by thirty-eight feet, with sheds, carriage-house, piggery, poultry yards, &c., attached, which have cost about $1,700; I have entirely remodelled and repaired my dwelling-house, at an expense of about $2,500; I have built a small greenhouse, with a cellar and well, for raising foreign varieties of grapes, which has cost about $160; I have made two hundred rods of substantial stone wall, and

have dug three hundred and fifty rods of drains; I have set out about three hundred fruit trees, comprising the choicest varieties of apples, pears, peaches, plums, cherries and apricots; I have hauled at least five hundred loads of sand a distance of a mile and a quarter, which has been spread upon the land, and is now thoroughly incorporated with the soil, and has changed the character of it, preventing it from baking or cracking during severe droughts, and causing the crops to start much earlier in the spring; I have paid out in cash for manures about $500, and have made various other minor improvements on the farm.

But, as I have before stated, I do not enter my farm for a premium on account of its magnitude, or as being a model farm on a small scale; neither do I claim any superior mode of cultivation; but simply on the ground that I have taken it in a miserably dilapidated and worn-out condition, and have put it in such a state that it will compare favorably with a majority of the farms in our county.

The following statement will show the comparative condition of the farm when purchased, and as it now is:—

Produce of Elm Vale Farm in 1841:—		
Say about five tons of hay, worth . . .		$75 00
Produce of the same for the year 1853:—		
25 tons English hay, . .	$20 00	$500 00
3 " squashes, . .	40 00	120 00
25 bushels onions, . . .	60	15 00
350 " potatoes, . . .	1 00	350 00
2,500 heads cabbages, . . .	06	150 00
60 bushels oats, ...	60	36 00
40 " corn, ...	1 00	40 00
25 barrels apples, . . .	3 00	75 00
Tomatoes, cucumbers, melons, green corn and peas,		35 00
Cherries, pears, peaches, quinces, &c., . . .		25 00
Pork, fatted mostly upon milk and refuse potatoes and apples, ...		90 00
Calves, ...		18 00
		$1,454 00

No account is made of butter and milk, garden vegetables, fruit, &c., used in the family.

Original cost of the farm, ...	$2,900 00
Cost up to the present time about, . .	10,000 00
Farm expenses for 1853, ...	516 00

Elm Vale Farm, North Andover, Nov. 15th, 1853.

MIDDLESEX.

In the discharge of their duties, the committee have visited the remotest sections of the county; they have, therefore, had excellent opportunities to observe the general aspect of our agricultural towns, and to ascertain, somewhat critically, their condition and prospects in regard to agriculture. One opinion, and the same feeling, seem to have been common to us all while engaged in our investigations. Taste and labor combined are every year making our beautiful county still more beautiful; so that ere long the poet will cease to be quoted when he says, "God made the country." The traces of enterprise, skill and perseverance, are becoming as manifest in the fields and around the rural homesteads, as in the cities; so that neither city nor country can now claim to be, exclusively, God's work. His sunshine falls on both, and in both alike the blessing assumes many beautiful shapes.

It may be said that with a liberal outlay of wealth any farm may be made beautiful. Very true, provided the money be judiciously, and not foolishly expended. And this leads us to throw in a remark based upon what we have repeatedly seen. We are persuaded that farmers still need to learn where to spend, and where to pinch, in conducting their operations; in other words, to ascertain the point up to which money spent for the farm is good economy, and beyond which, expense becomes extravagance. It is no economy at all to save the expense of a good plough, for instance, and to lose twice its cost, in a crop made scanty by poor ploughing.

By such economy, the poor farmer is made still poorer; his "poverty" as the Scripture says, "is his destruction."

We were pleased with the combination of the useful and ornamental which we saw in Mr. Wheeler's cornfield. It sug-

gests a theme of great practical importance. As the progress of agricultural science and art is promoted among us, these combinations will become more and more common. Taste, insinuating itself into the operations of the farm, will often avail itself of some accidental feature of a field, or some chance location of trees, or shrubs, or water, to make them subservient to the general beauty of the landscape.

CHARLES BABBIDGE, *Chairman.*

In order to obtain as full information as possible from those applying for premiums on farms, the committee propounded the following questions:—

Replies of Daniel Tuttle, of Acton.

1. Of how many acres did your farm consist in 1848?

A. Ninety-five acres.

2. What was the condition of the land at that time, in a good state of cultivation, or otherwise?

A. Mostly bound out and up to brush.

3. What proportion of it was in tillage, pasture, and wood?

A. Tillage, thirty acres; pasture, fifty; wood, fifteen acres.

4. What amount of hay cut in 1848 and in 1852?

A. Twenty tons in 1852; twenty-six tons in 1853.

5. What grain do you raise?

A. Corn and oats.

6. What roots do you raise, and what value do you place upon them as food for stock?

A. Flat turnips and carrots, and I believe them profitable as feed for stock.

7. At what time do you seed down grass land, spring or fall, and at about what date; kind and quantity of seed, and with what grain best?

A. In the spring, eight quarts herds-grass, half bushel redtop and eight pounds clover to the acre.

8. At what time do you apply top-dressing to grass land, and why at that particular time?

A. In October.

9. How do you apply manure, composted, or not; ploughed under or on the surface, and what quantity per acre?

A. Composted, and thirty loads to the acre.

10. Do you use guano, how, and with what results?

A. Do not use it.

11. The same of plaster and lime?

A. Have not used any.

12. What course do you pursue in draining—open or under-drains, use tiles, stones, or brush?

A. Open drains.

13. What depth do you commonly plough—do you use the subsoil plough, and think it advantageous or not?

A. Ten or twelve inches.

14. Have you reclaimed bog meadow, and how?

A. Yes, by ploughing.

15. How much, and what live stock do you keep, and what breeds?

A. Two oxen, ten cows, one horse, ten swine, native stock.

16. Do you employ oxen or horses, and which do you consider best?

A. Oxen and horse.

17. How much butter, cheese, or milk do you produce?

A. Butter and cheese, nine hundred lbs., made and sold.

18. What fruits do you raise?

A. Apples, peaches, pears, plums, and cherries.

19. What do you consider the cheapest fences?

A. Stone wall.

20. Do you consider the careful cultivation of a garden essential on a farm?

A. I do.

21. Is there profit in raising swine?

A. I think there is.

22. What extent of orcharding have you, apple, pear, peach, or plum?

23. What distance from each other do you set your trees?

A. Thirty-three feet.

24. Do you wash them, and if so, what with?

A. Yes.

25. Do you keep them under cultivation, and with what crops?

A. I do, with corn and other crops.

26. Do you think old orchards may be new topped and cultivated with profit?

A. I do, but think they should be cut closer to the body to prevent them from being too tall.

27. Do you keep a journal of your farm operations?

A. Do not.

Elijah Wood, Jr.'s, Statement.

The farm, in part, which I offer for premium, I purchased in 1840, it being in a low state of cultivation, with a large proportion of pine plain land, which had been cropped to death with rye. The buildings were very poor and inconvenient. The main house had been thoroughly repaired, new put up, making a convenient tenement for my father and myself. The barn has been built anew. The first year after the purchase, all the stock that could be kept in the winter on English hay, was five cows and a horse, and that, a share of it, was cut where the cows are pastured now. Since that time I have added some 140 acres; about equal proportions of meadow, woodland, and light pasturing. The pasturing has all been ploughed and manured, except the last, purchased in 1849, and that comes in turn next year. I plant with corn one or two years, as the case may be, ploughing from seven to eleven inches, according to the depth it was before turned, and the nature of the soil, endeavoring to run a little deeper every year, spreading on from twenty-five to thirty-two loads of compost manure to the acre, and plough again (if sod land) as low as can be without disturbing the sod, (if not) make one turning answer the purpose. I have this year used the swivel plough to avoid the dead furrow. I prepared a compost for the corn-hills, never more than 300 lbs., of guano for the six acres, (this year only 150 lbs.,) with about four proportions of plaster. All the ashes made in the house, and excrements from twenty hens, are mixed with two loads of loam, and thrown over every day till used, when but a small handful is put in each hill. The crop is hoed level three times, sowing before the last hoeing, six quarts of herds-grass, one peck of redtop, and five lbs. clover. If exclu-

sively for pasturing, I sow three or four lbs. of white clover. In that way, I have raised for five years an average of not less than forty bushels of sound corn to the acre. If the grass fails, in part, I scatter more seed in the spring and bush it in. When it is to be grazed, the cows are kept from it till it gets a good start, sometimes a foot high. Nearly all my high land has been laid down in that way for twelve years, because of the saving of labor. My pasturing is in four lots, and I am convinced of many advantages in the division. More stock can be kept, by one-eighth, on a given number of acres; and by keeping on each, one week at a time, when you come to the fourth the grass must be fresh and large, and the cattle are quiet and peaceable, which is not the case when in one lot; I am a believer in the old saying that a "change of pasture makes fat calves."

Of stock, I made a small beginning, keeping but four cows the first summer, and hired part of the pasturing at that; and in the winter kept seven, partly on meadow hay. Now I keep twenty-five head in the winter on the same number of acres mowed over, and what land I have bought helps to increase the number from thirty-seven to forty, with the additional purchase of $30 worth of meadow grass standing. In the summer I keep from fifteen to twenty cows, varying as my customer wants milk, knowing that he must be supplied in August, when the feed is short, as well as in June, when it is green and sweet.

Moist land I depend upon entirely for grass, having turned nearly all my high land to pasture except a few acres, an orchard, where I raise all kinds of vegetables, southern corn, &c. I am fully satisfied of one fact, that the more land a person has (if he undertakes to cultivate and manure it sparsely) the poorer he is. I have about thirty-five acres of the moist land, twenty of which have been reclaimed, the rest is on the river, and liable to be covered with water one-third of the year; experience has taught me to let that alone. My great desire was to improve the land—never being satisfied to raise *only* my own corn and potatoes; some four acres had been gravelled by my father, but improvements on meadows in those days were hardly known. The meadow was uneven, and not sufficiently drained, all the ditches running from the edge to the centre, not even one head ditch on the whole farm. The gravel in

some places was a foot thick and in others very shallow. Draining and ploughing those pieces and incorporating the gravel with the mud, were among the first of my improvements, causing the land to produce two crops every year since. I plough late in the fall, land that has been once fixed, and sow with oats and grass seed the next June, because I cannot spare the feed in the fall. New meadow should always be ploughed if possible; if not, gravel; never burn except to get rid of roots, or stumps, or hassocks bogged off, and then gravel or level up with loam. I have seen the bad effect of burning meadows on some of my neighbors' farms. Ashes produce great crops for three or four years, and then it is in a worse state (if not heavily manured) than before. Ashes in their effects are precisely like rum, exciting for a short time. Some of the land that I have reclaimed was very miry, requiring the plough to be drawn with ropes attached to something permanent on hard land, other lots have been gravelled in the winter when frozen.

Some three acres were completely covered with wood and brush; the stumps were taken out, the heights were bogged off, and burned, then loam and gravel from an old road spread over it. The last lot that I reclaimed was very near the river; it was covered with alder and skunk-cabbage, and so wet that man or beast could hardly walk on it. Now, it is one of the best pieces on the farm. Draining is the foundation of all improvement in low land, and requires more judgment than either of the other departments of farm work. Marginal drains must be run, where, and how near together, is the question. I have of that description, with stone laid in the bottom, and covered, between five and six hundred rods, and one hundred rods, with joist, and pieces of rails, and boards, in the bottom. The first cost of covered drain is much more than those of open, but after once made, more grass will grow on them than on other parts of the piece; there is no cleaning out to be done and they will last as long as the present generation. We have in our vicinity hundreds of acres of land, not mud, but black soil, where the water oozes out till June, which, if it was taken off would produce twice the hay, with the same manure, and that of a much better quality. If

stone is scarce there are other materials. Where there is a will there is a way.

I have set three hundred and fifty trees of different varieties, mostly apple, which are doing well, except the first hundred; in that lot I was deceived, the seller not giving me the trees I bought, viz.: large and well-shaped heads, but sent me crooked trees and without limbs. I soon became discouraged, partly on account of the poor trees, and on account of *encroachments* and distance from home. The land is now laid down to grass and the few remaining trees will soon die a natural death, I hope. Dear-bought experience has taught me that I had better pay a dollar for a good tree, than to have a poor one for nothing. By a good one, I mean one that has large and fibrous roots, a straight trunk with the top well-shaped and trimmed, and high enough to let the team near it. Of the whole number all started but six, the first season, some few have died in the hard winters, and peach trees from the effects of the borer. Always mulched them the first year. I believe it no use to undertake to raise fruit without the mind is made up to keep the ground under cultivation at least two years in three. As to manure, it has been my constant effort to make and use as much as possible, from the barn-cellar, yard, hog-pen, vault, sink-drain, &c., always using it the present season. I keep loam constantly in the cellar which is ready to be put to the droppings. It is always thrown over directly after haying, and used either for fall seeding or for a top-dressing. I then commence a new pile by wheeling loam into the lean-to through a door expressly for the purpose and put it down the trap doors, and by so doing the manure thrown over below can remain for a while. I used as a top-dressing last year four hundred loads. Every thing collected, up to November, is used on grass. I then commence the winter stock by carrying one hundred loads of mud or black earth to the cellar, and throw on to the droppings during the winter as often as once a week. I find it almost impossible to make manure heat in my cellar, and for that reason I carry it to the field to mix. I consider it one man's time for the year to do the work connected with the manure heap. When I commenced on the farm little help was hired, but from year to year more help was needed, and for the last three years in

summer have had three men and worked out more or less. In this account no credit is given for labor of man and oxen which were kept in winter drawing wood, stone and gravel for the benefit of the farm

Receipts, in 1852:—

Milk at the Car,	$1,573 75
Ruta-bagas and Carrots,	167 00
For work off the farm,	211 00
For Apples sold,	49 00
Calves,	36 00
	$2,036 75

Expenses, in part:—

Labor of two men,	$235 00
One man and boy three months,	78 00
For grass and hay,	97 00
Expenses for grain,	235 00
	$645 00

Concord, Mass.

Samuel G. Wheeler's Statement.

In offering my farm for premium, I would state that it is only three years the first day of this month, since I took possession of it, and at which time, all the buildings were very old and in a state of decay, and with the exception of the dwelling-house not worth repairing. In the erection of my new buildings I had regard to convenience in their location, durability in construction, and beauty in appearance. You having examined the same, can best judge how far I have been successful in my labors.

The walls and fences on my whole farm were in very bad condition, and my cattle had almost an uninterrupted range over the whole place. I have laid about two hundred rods of heavy-faced and bank wall, three hundred rods of heavy balanced wall and about one hundred rods of chestnut post and board fence. I have set out nearly two thousand fruit and ornamental trees, and have so improved my whole farm by the use of stable manure, meadow muck, and guano, that my crops this

year will be more than three times the amount of the first year's product. I have enclosed about eight acres for a permanent garden, in which I have set out one and a half acres with choice strawberry vines, also half an acre with nine thousand asparagus roots, two years old, the balance in vegetables of all the various kinds, and which will yield large crops. The two fields of corn containing twenty or more acres, had no manure put on the land. After the ground was furrowed for planting, I put to each hill a table-spoonful of Mexican guano and plaster, well mixed, one-fifth guano, four-fifths plaster. A little earth was put over this with the foot, before the corn was dropped so that it did not come in immediate contact with the compost. The upper field, which is a light soil, was hoed but once, owing to hurry of farm work. I do not see but it is quite as good as the other field and the product will be as heavy. From the various experiments I have made for the last two years in the use of Peruvian and Mexican guano, I have the highest opinion of their great value as fertilizers. For some crops, I think the Mexican equal to the Peruvian, and for *any crops*, I think half of each, mixed with plaster as above, will produce as good crops as Peruvian alone. The improvements made to my old house, (part of which is one hundred and seventy years old,) you have seen and can judge of their convenience. I would not be willing to exchange it for any farm or mansion-house in the State however costly it may be.

Concord, October 4, 1853.

WORCESTER.

The farm of the Messrs. Meriam is all well cultivated, but not so much better than many of our good farms as to justify the awarding of a premium. But their improvements upon swamp and meadow land present strong claims. Their statements of their proceedings will accompany this report, and need not be here repeated. The results, as stated by them, the committee believe to be correct. The committee saw some parts of their meadow land which had not undergone the process of improvement, and some parts of their swamp land

which was in its original state. The former had not a crop on it which would pay for mowing, and the latter produced nothing but weeds and bushes. The Messrs. Meriam are worthy of credit for their courage and perseverance, and have been rewarded with great success.

REJOICE NEWTON, *Chairman.*

Statement of the Messrs. Meriam.

Our farm, which we entered for the Society's premium, consists of 260 acres, of which about 85 acres are in mowing and tillage, the balance in pasturage and wood. This year we have about 25 acres in corn, wheat, rye, oats, potatoes, carrots, &c., and 60 in mowing. Our yield of corn will be this year about 75 bushels per acre, average for the last five years 60 bushels; wheat 20 bushels, oats 33, rye 16, potatoes 100, carrots 500 bushels per acre. We cut this year, as near as we could estimate, about 120 tons of hay, being an average of two tons per acre; we had many acres that would yield three tons the acre; and that on improved swamps and interval—having about seven acres of swamp and twenty of interval improved. The interval has been much improved by turning over and seeding down in August or September. We have about forty acres of interval and improved swamp land mostly in one body, to which we have given most of our attention for improvements for the last few years. To our other lands the committee will see that we have paid but very little or no attention, with a view to improvements, although it is of a kind and quality that would be susceptible of great improvement with but small outlays, but have confined ourselves to about one hundred acres, which we think we are in a fair way to bring into a high state of cultivation with but very trifling outlays, as the most have paid the expense of improvements the first year. Our swamps are mostly got into mowing by planting with potatoes, and we have obtained good crops, all but one year and that was lost by the rot.

We find ourselves at a loss to make a correct return of the expense of carrying on our farm, as much time of ourselves and help is occupied in making improvements and work of the farm

particularly in the winter. We hire two men by the year at $150 each and board them, (we do but little labor ourselves, as our health will not permit us to do much hard work,) and in addition, we hire by the day through the summer, about fifty days at 85 cents a day and they board themselves. For getting our hay and grain, we hire three men at $1.25 a day, about twenty days each, besides our steady help, they boarding themselves. Besides the crops before specified, we have milk, butter, eggs, fruit, vegetables, and in fact almost every thing that a farmer raises and has to dispose of, and which finds a ready market at our door.

Auburn, October 24th, 1853.

P. S.—The year before we came upon the farm there were not more than ten tons of hay cut upon it, and a large share of that was of poor quality; the first year after we came on to the farm we cut some fifteen or twenty tons, about six of this was clover that had been seeded down the year before, and for the balance we did not get two or three tons to the acre, but it took two or three acres for a ton, and much of that of very poor quality; and where we now get sixty bushels of corn to the acre, it had been sown year after year to buckwheat until they could raise nothing else.

WORCESTER WEST.

The committee were called to examine three farms, all entered for the society's premium on farms of 100 acres and over. As but one premium was offered on farms of this description, the committee were confined to the awarding of a single premium.

The first farm visited was that of Mr. David Bacon of Barre, and is the same for which he received the society's second premium last year. For a particular description of which see last year's report.

The only peculiarity in the management of his farm which your committee noticed, was the stabling of his cattle and horses on the ground, upon beds of dry muck and litter, suffering the cattle to stand upon the muck till it had absorbed its

fill of liquid manure, or till the accumulated heap required its removal.

Mr. Bacon is confident he derives greater benefit from this method of making manure than he should from the use of a cellar. He saves the expense of stable floors, retains all the droppings of the cattle, and by the use of litter keeps his cattle warmer through the winter than they would be to stand on floors. This subject is worthy the consideration of farmers.

The last farm visited was that of Mr. Benjamin F. Hamilton, of New Braintree. What he has done is stated in his communication to the committee, which is as follows:—

My farm contains 103 acres—six in wood, and ninety-seven under improvement. The valuation on the assessors' books is $7,000.

The interest of which is, ...		$420 00
The number and value of my stock is—		
One horse, ...	$125 00	
Two oxen, ...	125 00	
Twenty cows, ...	600 00	
One yearling heifer, ...	18 00	
Seven calves, ...	70 00	
Four shotes, ...	40 00	
	$978 00	
The interest is, ...		58 68
Interest on cost of tools, repairing the same, and blacksmith's bill, . .		40 00
Amount paid for labor, ...		250 00
My own labor, ...		125 00
The labor in the house, ...		110 00
		$1,003 68

The produce is as follows:—

30 acres corn, 150 bushels, ...		$150 00
⅓ acre of corn for fodder, ...		30 00
⅔ " potatoes, 50 bushels at 50 cents, . .		25 00
4 " barley, 150 bushels, at 5 shillings, . .		125 00
½ " carrots, 75 bushels, at 25 cents, . .		18 75

30 cart-loads pumpkins,	$45 00
Apples,	25 00
55 tons good hay, at 15 dollars,	825 00
5 " swale and meadow hay, at 5 dollars,	25 00
3 " corn-stover,	15 00
4 " straw,	20 00
8,500 lbs. cheese, at a fraction over $10\frac{3}{4}$ cents per lb.	919 49
125 lbs. butter, at 22 cents,	27 50
1,883 lbs. pork, at $8\frac{1}{4}$ cents,	155 35
Small pigs, sold for	36 00
13 veal calves,	97 98
Estimated value of produce of farm consumed by family is,	250 00
	$2,760 07

In the number of cows I milked were 2 two-years old and 3 three-years old heifers, and one farrow cow. Two of my heifers lost their bags, so that I did not consider them both worth more than one would have been had their bags not have been injured. I have sometimes averaged 500 lbs. of cheese from a cow, after fatting the calf.

I have expended considerable in improvements within the last three years. I built a barn 100 by 42 feet, 18 feet posts, with a cellar under the whole, at a cost of $1,700. The materials used were of the best kind, and the work done in a very thorough manner throughout. I have expended on my house, and buildings connected, including front fence, $1,000, and have expended $100 in bringing water from the brook to my house and barn, a distance of 26 rods, by a hydraulic ram. I have paid $100 for blasting rocks from my mowings and fields, and have built 237 rods of stone wall, at a cost of two dollars per rod. My walls are very heavy. I have dug a trench from one to two feet deep where I have built wall, for two reasons. One was, I wanted the loam to fill the holes where I blasted rocks, which was no small job, and to make compost manure with. I have expended $25 in reclaiming about an acre of meadow land, and have made it produce twice as much hay, and of excellent quality. I have used about 300 loads of compost manure yearly, and have increased my crop of hay fifty per

cent. within the last three years. I have set about eighty young apple trees, and fifty other fruit trees, such as cherry, plum, peach, pear, &c. I have grafted thirty apple trees with the best kind of fruit, and ten pear trees.

All of which is respectfully submitted to the committee.

New Braintree, November 21, 1853.

This statement, like all others which we have seen of farming operations, must be taken with a discount. The amount actually realized from this farm does not probably exceed $1,200 gross cash income, out of which actual expenses are to be paid. All the balance of nominal income is consumed on the farm. Your committee were of the opinion that the affairs of this farm were managed with great system and care. Every thing was in order; the stock was good, and the quantity and quality of the products may be judged of by the price they brought in the market.

But the attention of the committee was chiefly called to the improvement made on the place within the last three years, or since it has come into the hands of the present owner. Improvements made for all coming time, and for all future occupants of the farm.

The stones for 200 rods of wall—most of it more than four feet wide—taken from the mowings and plough-fields, is so much done, not only for the present occupant, but for all who may come after him on the farm. The barn and other buildings, erected by him, are a model for all who wish to make permanent, convenient, and—in the opinion of your committee—really economical improvements.

The committee, believing it to be one of the great objects of this Society to encourage such investments, and such a system of farming as Mr. Hamilton is pursuing, have no hesitation in awarding him the Society's first premium.

Freeman Walker, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From all the observations your committee have made, we are satisfied that agricultural improvements are progressing within the limits of our society; that the subject of making and saving manure is better understood, and that a spirit of inquiry is abroad among the farmers. We would say go on with your improvements, and rest not satisfied till you are entitled to our highest premiums.

In awarding the premiums, the committee felt bound to be guided strictly by the rules of the society, which read thus: "For the best conducted farm with the most economical improvements."

PAOLI LATHROP, *Chairman.*

November 30, 1853.

Statement of Linus Green.

The farm I offer for premium contains one hundred and fourteen acres, situated in Hadley. It has generally a clayey soil; but nearly one-third, is gravelly and light. Twenty-six years ago, I began to cultivate the premises. The land, at that period, was, in part, wet, swampy and overrun with bushes; and in part, poor, worn out, and comparatively unproductive. The whole is now in a high state of cultivation. There is not half an acre, that I have not ploughed. My custom has been to plough eight or nine inches deep, with three pairs of oxen; to observe a systematic rotation of crops; to introduce economical improvements; to compost my manure with oyster shell lime for top-dressing, and to mix varieties of seed corn and grass seed. On moist land, my herds-grass seed and redtop are usually sown in the proportion of two pecks of the latter, to one peck of the former.

During the present year, I have mowed thirty-one, tilled thirty-five, and pastured forty-eight acres. The part in cultivation, was distributed as follows: twelve acres in rye, eleven and one-half in corn, nine in oats, two in wheat, and a half acre in potatoes. I have performed all the labor, assisted by three boys; one of eighteen, another of sixteen, and the youngest, eleven years old. We have spread about five hun-

dred and seventy-five loads of manure; four hundred and seventy-five of compost, and the remainder of pure barnyard droppings.

I give the items of produce and expenditure, premising that the crop of corn is estimated in the following manner: I counted the whole number of stacks, which are of similar size and appearance, and the whole number was eight hundred and twelve. I selected sixteen stacks, being the fair average sample of the whole. Each of these stacks averaged twenty-seven baskets of corn, and each basket contained nineteen quarts and a half of green, shelled corn.

Products:—

75 tons of hay, at $10,	$750 00
834 bushels, 31⅞ quarts of corn, at 83 cents,	693 00
315 " rye, at 83 cents,	261 45
25 tons of corn fodder, at $5,	125 00
250 bushels, oats, at 50 cents,	125 00
15 tons rye, oats, and wheat straw, at $6,	90 00
35 bushels wheat, at $1.25,	43 75
45 " potatoes, at 42 cents,	19 10
12 " apples, at 75 cents,	9 00
Pasturage of 15 horned cattle, 26 weeks,	150 00
" " 50 sheep, 26 weeks,	43 00
375 loads of compost manure,	375 00
100 loads barnyard "	100 00
	$2,784 30

Expenditures:—

My labor, 250 days, at $1 per day,	$250 00
Boy's labor, 208 days, at 75 cents per day,	156 00
" " " " at 25 cents per day,	52 00
Grass seed,	25 00
Seed corn, 2 bushels, at $1,	2 00
" wheat, 3 bushels, at $4.50,	13 50
" oats, 20 bushels, at 50 cents,	10 00
" rye, 12 bushels, at 75 cents,	9 00
" potatoes, 3 bushels, at 50 cents,	1 50
Compost manure, 375 loads, at $1,	375 00

Barnyard manure, 100 loads, at $1,	$100 00
Interest on land, at $50 per acre,	342 00
Interest on buildings, at $1,000,	60 00
State, town and county taxes,	32 50
	$1,428 50
Net income,	$1,355 80

HADLEY, Mass.

Statement of William P. Dickinson.

Below you have a statement of the crops grown on my farm, the past season:—

23	tons	of hay, at $12,	$276 00
105	bushels	rye, at 83 cents,	87 50
17	"	wheat, at $1.42,	24 14
40	"	oats, at 51 cents,	20 00
300	"	corn, at 83⅓ cents,	250 00
65	"	Carter potatoes, at 75 cents,	48 75
33	"	" " (small) at 25 cents,	8 25
70	"	Merino potatoes, at 42 cents,	29 40
54	"	turnips, at 1 shilling,	9 00
8	"	buckwheat, at 50 cents,	4 00
2	"	herds-grass seed, at $3,	6 00
85	"	carrots, at 2 shillings,	28 33
20	"	early potatoes, at 75 cents,	15 00
16	"	ruta-bagas, at 25 cents,	4 00
50	"	broom seed, at 2 shillings,	16 50
600	pounds	broom brush, at 5 cents,	30 00
1½	tons	of husks, at $14,	21 00
Corn fodder and straw,			25 00
			$902 87

As your committee, from observation and previous statements, know something of the former condition of my farm, I do not think it necessary to make a statement of it at this time.

I have employed one man and paid him one hundred and twenty dollars for the year, and have done other work to the amount of ninety dollars, leaving only thirty dollars as the

amount of hired labor. I have expended fifty dollars for lime, salt, and bone dust. I have found lime very good for corn, and as a top-dressing for grass. I used a mixture of two parts lime, two of plaster, and one of bone dust, for potatoes—putting a handful in the hill at the time of planting. I left four rows in the middle of the field without the mixture. These rows were hardly worth the digging, while the remainder, for this year, were very good. I have tried subsoil ploughing, but cannot, as yet, see any good result from it; still, I shall try it yet again. I practice turning up a part of my mowing land, each year, in August, and give it a dressing of fifteen loads of compost manure to the acre, and sow one-half bushel of herds-grass seed and one bushel of redtop seed to the acre. I have mowed the past season, two tons to the acre, where last year, it was hardly worth the mowing. I ploughed it in August, 1852, and put on a dressing of lime and ashes, and sowed it with herds-grass and redtop seed.

HADLEY, Nov. 22, 1853.

Statement of Josiah Allis.

In compliance with the rules of your society, I beg leave to submit the following statement:—

My farm is situated in the easterly part of the town of Whately, containing about ninety-five acres of land. I made my first purchase there, in 1826. It had been used for growing rye and corn, and some hay, for years before; and some six years after, as a piece of out-land, and all the crops were carried off from the farm. I moved on to it in 1832, and commenced, in a small degree, to improve it. At that time, I could not keep more than from six to eight cattle upon it through the winter. In 1836, I attempted to raise a crop of teazles upon it. I had found, at that time, a spot on the farm large enough to raise the plants to stock two or three acres; but not having land on my farm good enough to set the plants, I hired of Mr. Moses Stebbins, of South Deerfield, some two acres of his fine, rich, alluvial soil, at the rate, I think, of about twenty or twenty-five dollars per acre, and we grew a fine crop upon it. Not being satisfied with hiring land at that

rate, while owning so much, I determined again to improve my own, as well and as fast as I could, and at the same time meet my expenses. There is, upon this farm, some twelve acres of wood and unimproved land, including the river bank; and I usually pasture from twenty-three to thirty-five acres. This season, I have pastured twenty-three acres. Average stock in the pasture, four cows and two horses. It has been my purpose to increase my stock of hay, that I might be able to increase my "pile" of manure. We usually cast into our barnyard two or three loads of muck or sand, for every load of manure we expect to have. This, we do, the last of November. After carting out the compost made by the hogs through the summer, early in the spring we mix our manure made during the winter, with the muck and sand carted in during the fall, and shovel it over once or more, as it may require, and apply it on ploughed land for summer crops; sometimes ploughing it in, and sometimes spreading it after ploughing. As yet, I am undetermined which is the best method. By following this method, our manure heaps have gradually increased with the increase of our crops from year to year; and now we are satisfied that we are getting a rich return for the labor and expense of composted manures; and I herewith send you a statement of the crops grown on the farm this year, with the market value; not claiming, by any manner of means, that the farm is brought to perfection in cultivation, nor will it be, until the crops have doubled, and perhaps have quadrupled.

I had thirteen acres of corn, and at two bushels of ears for one bushel. Hay at four hundred and seventy-five feet to the ton.

75 tons of hay, at $12,	$876 00
200 bushels oats, at 50 cents,	100 00
1,000 pounds broomcorn, at 6 cents,	60 00
100 bushels seed, at 33 cents,	33 00
1 acre, 25 bushels wheat, at $1.50,	37 00
3,900 pounds husks,	30 00
17 tons stalks,	100 00
5 tons tobacco, at 10 cents,	1,000 00
650 bushels corn,	600 00

100 bushels potatoes, at 50 cents,	$50 00
Poultry,	75 00
250 loads compost manure,	200 00
9 shoats,	90 00
700 pounds pork,	56 00
Pasturing 4 cows and 2 horses,	65 00
	$3,372 00

Farm,	*Dr.*
4 laborers, $12.50 per month, for 8 months,	$400 00
Board, $6 per month,	192 00
400 loads manure,	400 00
Plaster, and extra manures,	100 00
Interest on cost for $3,200,	192 00
Taxes,	31 00
Corn for team and hogs,	180 00
Grass seed,	22 50
	$1,517 50
Balance in favor of farm,	$1,854 50

WHATELY, November 12, 1853.

HAMPSHIRE.

Agriculture is not excelled in importance, not equalled even, by any other art. When it flourishes, every other branch of business thrives. More than three-fourths of our population are employed in cultivating the earth. If crops are abundant, and find ready markets and remunerating prices, producers become liberal in their expenditures. Merchants, in consequence, make large sales, and manufacturers readily dispose of goods. Mechanics are employed in the erection of buildings, or in making the numerous articles of comfort, or convenience, suited to gratify the love of the ornamental and beautiful. On the other hand, if, through lack of science or industry, or of the timely rain and sunshine, the earth fails to "yield her increase," this great national bank ceases to discount. The farmer will buy only what he absolutely needs. Provisions rise in price as

the supply diminishes. Traders have fewer sales. All classes curtail their expenses.

The cultivation of the earth is the prominent business of our people, and the leading pursuit of our nation. It employs more men and more capital than all other trades and professions. It produces a greater amount and variety of articles, desirable and necessary, for our subsistence, our comfort and happiness. It gives to the largest class of our population that kind of employment which develops the physical and moral powers, and allows of quite as much time for the cultivation of the mind as any other occupation. It is cheering, therefore, to see that so many of the leading men of our country are disposed to encourage agriculture; that our government is toiling to aid; that many of our educated men of all professions are endeavoring to make it an exact science. We confidently hope the time is not far distant when there will be facilities for a true agricultural education, a knowledge of principles and practice, obtained by actual observation and experiment. Then, of agriculture we shall say, "It is a science, as well as an art." It is pleasing to notice the improvement that has already been made; to observe the change that has taken place in the public estimation of this business, and of the men engaged in it. Farmers are now better known, more respected, and have more influence in society than at any former period. The clergyman, or the physician, or the lawyer, is not now the only man qualified to preside at town meetings, and make a record of the transactions. The learned professions do not now furnish all those who represent the people in the halls of legislation.

While it is admitted, however, that there has been improvement in the knowledge and practice of this most important art, it must be acknowledged that the improvement in this pursuit has not kept pace with progress in other trades and professions, and with the great increase of our population. Relatively, there has been a falling off; and, absolutely, there has been a diminution in the production of breadstuffs in our State.

Why should this great pursuit retrograde, even relatively? Why not progress as rapidly and continuously as commerce, manufactures and the mechanic arts? No good and sufficient reason can be given. Many desire to become rich faster than

to advance by the slow but sure process of digging their treasures from the earth. Their anxiety to become affluent at once, and consequently above the toil and drudgery of tilling the ground, leads them away from home to seek other more popular and lucrative employments, at the peril of health, and morals, and even life. Many who are engaged in this most necessary, healthful and interesting occupation, feel very little interest in their employment. They pursue it, not from choice, but from force of circumstances. Having failed to obtain other business, or having been unfortunate in their chosen vocation, they fall back to tilling the ground. Many cultivate their lands for immediate profit, rather than ultimate improvement. These make as little outlay as possible in the management of their farms; and, instead of investing their increase of capital, from time to time, in their legitimate business, as do those who are engaged in commerce and navigation, merchandise and manufactures, they invest in railroad or other stocks. Some give almost exclusive attention to one field or one particular crop, instead of studying to improve their whole farm, by adapting the crop to its peculiar soil. How easy to enrich one field and produce one large crop, by making every other part of the farm pay tribute to this one. These errors we hope to see corrected—at least not to see them so common. We hope this important branch of business will hereafter receive more and more encouragement from government, from agricultural societies, and from men of science.

The good influence of associations, annual exhibitions, addresses, reports and statements, is perceptible in the improvement of buildings and fences, in the clearing of unseemly hedges, in the removal of stumps and bogs, and in the general appearance of comfort and thrift. One neighbor stimulates another; one learns from the example and practice of another; and each becomes more interested in his work by seeing and hearing of the successful or unsuccessful experiments of others.

For a description of the farms which received premiums, and the manner in which they have been managed, we refer to the statements below.

M. B. Green, *Chairman.*

Statement of Moses Stebbins.

The farm which I enter for premium contains forty-one acres, situated near the Connecticut River, in South Deerfield. When I came in possession, in 1831, ten acres of it consisted of a poor, worn out, buckwheat field. In 1838 I resolved to have a better farm. I hauled on clay, at the rate of fifty loads per acre. Then I spread twenty-five loads of manure to the acre, sowed two hundred pounds of plaster, ploughed all in together, planted corn, and obtained a fair crop. At the outset I tried but three acres, by way of experiment, and after witnessing the result, I continued until I had treated the ten acres alike. After corn, I planted oats, and stocked down to clover.

By use of clay and manure, I have made all my land as good as the best, and increased my pastures one hundred per cent. in quantity and quality of feed. I have practised ploughing deep, and do so now, but in a different way from my former practice. I now plough in manure four or five inches deep; then subsoil as deep as I can run a subsoil plough. I prefer this to running deep, in order to turn up the subsoil. I commonly plant my land two years in succession; thereby mixing soil and manure, and pulverizing the soil for grass. Instead of oats I raise barley, which I deem far more profitable to the farmer. Where we made one hundred loads of manure in 1838, we now make three hundred and fifty loads. I haul from seventy-five to one hundred loads of earth into my barn and hog yards, annually, to absorb the liquid manures, which I consider as valuable as the solid. I think much of hogs for the manufacture of compost manure. I have used salt with good results, on both grass and wheat. For old worn out pastures, I recommend the free use of plaster, and for fruit trees, I apply salt and lime, freely, and wash often with white lye.

My farm has been divided, the present year, as follows: twenty-three acres of mowing; thirteen acres in corn and potatoes; three in barley, and two in wheat. My stock consists of three pairs of oxen; three steers, three years old; five cows; seven two years old; three yearlings; one hundred and fifty sheep and twenty-five hogs.

Products:—		
Corn, 750 bushels, at 90 cents,	$675 00	
Hay, 55 tons, at $10,	550 00	
Pork sold,	250 00	
Corn-fodder, 35 tons, at $5,	175 00	
Barley, 100 bushels, at 85 cents,	85 00	
Cash received for labor,	75 00	
Wheat, 40 bushels, at $1.50,	60 00	
Potatoes, 75 bushels, at 50 cents,	37 50	
Corn-fodder sold, 2¼ tons, at $15,	33 75	
Straw, 4 tons, at $6,	24 00	
		$1,965 25

Expenses:—		
Labor,	$300 00	
Corn, 200 bushels, at 87½ cents,	175 00	
Oats, 100 do. at 50 cents,	50 00	
Ashes, 300 do. at 14 cents,	42 00	
Plaster, 2 tons, at $9,	18 00	
Clover seed, 60 lbs. at 12½ cents,	7 50	
Corn-fodder, 5 tons, at $5,	25 00	
Straw, 2 tons, at $7,	14 00	
Interest on land, valued $3,200,	192 00	
Taxes,	25 00	
		848 50
Net profit,		$1,116 75

DEERFIELD, November, 1853.

Statement of Austin Smith & Sons.

The farm, which we enter for premium, contains seventy-three acres, situated in Sunderland. It has been our aim to increase, economically, the productiveness of the whole farm, and to raise useful, and remunerating crops. This, we have endeavored to do, by the making, saving, and proper application of manures, and by thorough cultivation of the soil.

It is our practice in raising Indian corn, to plough, or harrow in manure, at the rate of twelve or fifteen loads to the

acre, and to apply a handful of ashes, in the hill, at planting. We hoe four times, and usually seed the land with clover, red-top, and timothy, for the next year's mowing.

We have put compost manure for broomcorn, in the hills, at the rate of sixteen loads to the acre, until the present year; when we have applied it, as on our Indian corn land, at the rate of twelve loads to the acre. We added half a spoonful of super-phospate of lime and plaster in the hill. We planted our broomcorn with Woodward's corn-planter, and we have never known our land so well and uniformly stocked, as the present year.

We prefer, for a wheat field, to turn over a rich and warm clover sward. Oats we have nearly done raising. We plough from six to nine inches deep, and loosen the soil a little deeper each succeeding year. We usually make about three hundred and fifty loads of manure every season.

During the present season, our farm has been divided, as follows: twenty-seven acres in mowing; ten in Indian corn; fourteen in broomcorn; five in rye; two in wheat; one in oats; one in carrots and sowed corn; thirteen in pasture.

The following table correctly exhibits the products, expenditures and net profit of our farm, the present year:—

Products:—

580	bushels of	corn, at 92 cents, . .	$533 60
11,900	pounds of	broomcorn, at 5½ cents, .	654 50
980	bushels of	broomcorn seed, at 40c.,	392 00
52	do.	wheat, at $1.50, . .	78 00
115	do.	rye, at 87½ cents, . .	100 05
45	do.	oats, at 50 cents, . .	22 50
50	do.	potatoes, at 40 cents, .	20 00
50	do.	carrots, at 33⅓ cents, .	16 66
16	do.	turnips, at 25 cents, .	4 00
40	tons of	hay, at $12, . . .	480 00
23	do.	corn-fodder, at $6, . .	138 00
2½	do.	wheat and oat straw, at $6,	15 00
3½	do.	rye straw, at $5, . .	17 50
624	pounds of	butter, at 16⅔ cents, .	104 00

350 loads of manure, at $1, . . .	$350 00	
Improvement of farm, ...	100 00	
		$3,025 81

Expenditures:—

Our own labor, 452 days, at $1, . .	$452 00	
First hired man, 8 months, 5 days, at $20,	170 00	
Second do. 8 months, at $19, . .	152 00	
Third do. 7 months, 13 days, at $18,	136 00	
Grass seed, ...	10 00	
2 bushels of seed corn, at $1, . .	2 00	
3 do. oats, at 50 cents, . .	1 50	
4½ do. rye, at 80 cents, . .	3 60	
3 do. wheat, at $1.50, . .	4 50.	
3½ do. potatoes, at 50 cents, .	1 75	
2 do. broomcorn, at 75 cents, .	1 50	
150 do. ashes, at 16⅔ cents, . .	25 00	
1½ tons of plaster, at $10, . . .	15 00	
Super-phosphate of lime, salt, and oyster-shell lime, ...	40 00	
350 loads of manure, at $1, . . .	350 00	
Interest on tillage land at $100 per acre,	360 00	
Interest on pasturage at $40, . . .	31 20	
Taxes on the same, ...	32 60	
		1,788 65
Net profit, on seventy-three acres, . . .		$1,237 16

SUNDERLAND, October 4, 1853.

Statement of Samuel Powers.

My farm is in Hadley, and contains eighty-seven acres. Fifty-four acres lie almost in one body, within half a mile of my dwelling. Twenty-one acres of pasture and twelve acres of woodland, are near Fort River.

I purchased, several years since, a number of acres of very trifling value, so filled with water as to be unproductive. But, by draining, ploughing and subduing, this land is now as beautiful in appearance, and as productive, as any in this region. It has

paid for all the improvements. I have, also, taken large quantities of muck or peat from my swamp, and spread it on lands at a little distance back. This has increased both the crops and value of the land, fifty per cent. or more. My pasture, consisting of twenty-one acres, is situated on Fort River; and, in consequence of being yearly overflowed, is very productive, and capable of keeping in good condition from eight to ten cows.

During the present year, I have cultivated fifty-two acres, as follows: twenty-seven acres in grass; seven in corn; five in broomcorn; five in rye; two in wheat; two in tobacco; two in potatoes; and two in oats. The labor has been performed by myself and a hired man. In hay time, I employed another hand; but, during the season, I worked enough for others to pay for him.

Products:—

40 tons of hay, at $10,	$400	00
1½ do. of tobacco, at $250,	375	00
420 bushels of corn, at 87½ cents,	367	50
1½ tons of broomcorn, at $110,	165	00
1 ton of pork,	160	00
150 loads of manure, at $1,	150	00
300 bushels of broomcorn seed, at 33 cents,	99	00
100 do. of rye, at 87½ cents,	87	50
40 do. of wheat, at $1.25,	50	00
80 do. of oats, at 50 cents,	40	00
75 do. of potatoes, at 42 cents,	31	50
	$1,925	50

Expenses:—

Labor,	$170	62
Grass seed,	4	00
5 bushels of rye, at 75 cents,	3	75
4 do. of wheat, at $1.50,	6	00
4 do. of oats, at 50 cents,	2	00
10 do. of potatoes, at 17 cents,	1	70
Seed corn,	1	18
8,000 tobacco plants,	4	00

150 loads of manure, ...	$150 00	
Interest on 54 acres, worth $5,400, .	324 00	
Interest on 21 do. worth $1,050, . .	63 00	
Town and county taxes, ...	30 00	
		$760 25
Net profit, . . .		$1,165 25

HADLEY, Nov. 25, 1853.

HAMPDEN.

The committee on farms respectfully submit their report upon the duties referred to them, viz.: the examination of such entire farms as might be entered, as competing for the premiums offered. The object of these premiums is one of the most important in its results that can arrest the attention of the farmer. It is—as the terms of this society declare in the offer—to ascertain from reliable data, "the most valuable and economical improvements in the cultivation and management of an entire farm, with all its appendages." This subject, in many of our sister societies, is made more deeply interesting in its details than most others pertaining to their transactions. They present the total inventory of the farm in all its appendages, and show to the farmer, and (through the press) to the world, the skill and enterprise of its owner. It is indeed a mirror, reflecting the lights and shades of a farmer's life; it details his operations and his success, as a guide for others; and no individual engaged in agricultural pursuits should permit the year to close until he has made this inventory of his affairs for his own use at least. Having the Transactions of the Worcester West Society now open before us, we look upon the report of two farms in the town of Barre, perfected in all their details, and the balance sheet exhibits more distinctly than argument, the value of the record. We would give an abstract from this report, with the pleasing hope that it would stimulate many in this county to favor us with their statements in future, but we will not disturb the unity of the whole, for a part; the whole is most earnestly recommended to the farmers of Hampden, as a model. And let it be ours to learn something from every

practical lesson. The statements to which we refer may be found in the Annual Report of the Commonwealth, on the transactions of the agricultural societies in this State for 1852, page 239; but to aid those who may not have the benefit of this volume for reference, we would suggest some of the outlines which should constitute the form and material of the statements, upon which the claim for premium should be predicated. The number of acres contained in the farm; the distribution of these acres in relation to their culture—as tillage, mowing, pasturage, woodland, and unimproved—with their aggregate value—the number and value of the stock kept on the farm, the manner of feeding and fattening all animals intended for slaughter, the separate and distinct operations of cultivating the various crops produced, the amount of manure made, how made, and how applied; the amount of help employed in the management of the farm, both men and cattle; these are some of the appendages which are required to sustain the claim of the applicant; and no statements are perfect unless they include the internal arrangement of his domestic interests, for no good farmer will ever desire to exclude the industry, economy and assistance derived from his partner, from a full participation in the exhibit of his success, for surely neither justice nor equity would ever award all the credit to the "OFF OX," for all the work done on the farm; so far your committee subscribe to the declaration of "*woman's rights*," in the full belief that in this way they will receive that just reward which their duties and diligence entitle them to receive, but which are now denied them, as *silent partners* in the concern. If an intimate knowledge of one's business is necessary to success in any concern, it is surely so in agricultural pursuits. This is in fact the true *Science of Agriculture;* a term too often misconstrued, and supposed by many to mean something etherial, and beyond the reach of ordinary minds; something desirable to possess, but too distant to be overtaken; while in fact, it is nothing more subtle or difficult of possessing, than a practical knowledge and an intimate acquaintance with the various duties of your vocation: in the mechanic arts, for instance, the steam engine is a complete union of mental ingenuity and physical application, and is a perfect demonstration of all we ask in favor of agriculture.

And whenever the mind is applied to this subject, with that energy which the subject demands, the hands will execute the design. And then, and not till then, will the science of agriculture keep pace with her sister sciences. But it will be said by many that this operation is attended with too much trouble; that the *charge* is worth more than the *game*. It is not such minds that we would address with the hope of success; but to the young farmer, who has or is about to engage in this employment, we can present no surer method to positive results and success, than to keep the memorandum of his daily operations well posted up. The time has come, and now is, for the friends of agriculture to make some demonstration, of a more elevated system of practice, and this can never be accomplished until the mind is made to coöperate with the hands. The materials are presented at every step; in every operation upon the farm there is something that offers a subject for investigation.

In presenting this subject, your committee are not insensible that they have assumed a broader range of remark than a mere presentation of their action (upon the duties referred) would seem to demand; but the importance of the subject has been deeply impressed upon our minds at every step of our progress in the pursuit of these duties. The great difficulty of obtaining the statistics of the farm, from those immediately interested, is the most convincing evidence that the subject has not received the attention which its importance demands, and we cannot forbear once more to solicit the careful consideration of every farmer to the subject. And were we permitted to offer one suggestion by way of counsel, we would repeat the advice of Ex-Governor Steele at our anniversary dinner table, "Plough deep—plough deep!" and we would add: let the soil represent the mind, and then plough as deep as you please, stir up the subsoil, and bring out the resources that have too long been hidden from the surface. In this way only can we improve the mind and the soil.

In presenting the statements furnished by the individuals competing for the premiums, we have but few remarks to accompany them. Such instances of successful enterprise are to us like some interesting volume in which we meet with so many absorbing recitals that we are turning down a leaf, or

marking for future use, almost every page in the book. The idea of enriching, and permanently improving an entire farm from its own resources, should be the prominent action of every farmer. The most judicious method of applying these resources, to obtain the greatest results, is the work of the mind. These resources may be considered as distinct, the one natural or mechanical, the other artificial or animal: the first costs the farmer comparatively little more than the expense of removal from their present location; the other, almost the entire products of the farm, in its manufacture. By natural resources it will readily be perceived that we refer to those means which are available, and within the reach of every one. Such are the head lands of his fields, the sides of his ditches, and other portions of his farm, which have long remained unoccupied, and have not only retained their natural richness, but have been annually increasing in value by the increase of decomposed vegetable materials. Clay is another resource which by being exchanged, load for load, with some other portion of the farm, will produce astonishing results. But a bed of good muck may well be considered the farmer's bank, the capital of which is unproductive until drawn out and put in circulation. It is like the specie, which redeems all drafts presented, and is still accumulating interest. Let every one who is a stockholder in such a bank realize his facilities, by presenting his frequent drafts upon the capital stock. The instance of Mr. Ashley is more pertinent to the point, and unequivocal in demonstration, than any theoretical argument however forcibly presented. One fact, practically illustrated in agricultural pursuits, we consider worth more than a thousand theories. And the statements of Mr. Ashley we candidly recommend to the consideration of every farmer, with the earnest hope that many of them will thus be induced to realize the full amount of all their resources, and communicate freely to the society the results of their experience.

FRANCIS BREWER, *Chairman.*

William Pynchon's Statement.

Having entered my farm for premium, I respectfully submit the following statement for the consideration of your committee:—

My farm contains ninety acres, which are divided as follows: The lot upon which my barn is built, contains fifty acres, and with the exception of twelve acres, which I have purchased the present season, enclosed with good post and rail and slab fence, the latter along the public road.

My principal crops are hay, corn, potatoes, tobacco, rye, and oats, and these fifty acres are mostly appropriated to these products in the following proportion:—about thirty acres in grass, seven to eight acres in corn, two to three acres in tobacco, and the balance in oats, potatoes, and other small crops. My usual way of managing this land, is as follows:—for my corn crop, I take that portion of my grass land which has been the longest seeded down, and consequently the tightest bound, and put on about ten cords of good manure per acre, and cover it to the depth of ten inches. This produces from seventy-five to eighty bushels per acre. For my tobacco crop, I take a portion of the land that I planted in corn the year before, and plough again to the depth of ten inches, and then spread on from the cart a good coat of compost, which I make with soil and yard manure, in the proportion of two parts of the former to one of the latter. This I harrow in thoroughly, and until the ground is very mellow. My tobacco land, prepared in this way, produces two thousand pounds per acre, and leaves the land in fine condition for restocking, which I do as soon as the tobacco is off. I use no plough in this operation, but give the land a good harrowing, and sow on the seed and roll it in. I think this preferable to ploughing, having tried both ways. The balance of my corn land I usually put in oats and stock at the same time. My oats average about sixty bushels per acre. My potato crop varies with the seasons. For my rye, and other small crops, I select such portions of land as need the plough and a little stimulus in the way of manure, and restock as opportunity offers. I use compost on my grass land, preferring the fall season for this purpose. After going

over with compost, I use a fine tooth harrow, which breaks the knobs and loosens the surface, giving the compost a better chance at the roots of the grass. My crop of grass is usually heavy, producing, unless affected by drought, two to three tons per acre. Managing my land in this way, I am enabled to keep it in good condition, always getting large crops at comparatively small expenditures. I consider my land worth from fifteen to twenty per cent. more now, than when I commenced this system of culture.

My barn is one hundred feet long, by forty-two wide, and cost me $1,700. This enables me to house all my crops, including my corn fodder, which, when properly cured, I consider of very great importance, and worth to me, $6 per ton, in keeping my young stock. The balance of my farm is in pasture, containing forty acres, and is enclosed with stone wall, and post and rail fence. I have this divided in two nearly equal parts by a fence running through the middle. I pasture only one-half at a time, changing from one to the other as they eat it down. With the assistance of a sprinkling of plaster in the spring, this keeps in fine condition, twenty or thirty head of young cattle.

I sell only such parcels of my crops as I cannot feed out to my stock advantageously, preferring to return to the soil all I take from it. My plan is, in raising or purchasing stock, to select none but the choicest breeds; this enables me, in selling, to obtain satisfactory prices, and makes farming a pleasant and profitable recreation.

SPRINGFIELD.

Edmund Ashley's Statement.

The farm which I offer for examination by your committee, contains sixty acres of rolling, uneven surface, embracing high gravelly knolls, and descending from these points, to low swamp muck beds, or to the margin of running brooks, leaving but a small portion that is level. This profile will exhibit these margins as naturally wet and spongy; and as productive, in its natural state, of little else than the coarse, sour grass and herbage, indigenous to such locations. The higher portions of this farm are evidently an argillaceous soil, well filled with

coarse gravel. The latter predominates largely. These features may be considered repulsive, and may have lent their influence, to the former proprietor of these acres. But from the cause we turn to the result. The farm had deteriorated for many years, and the products might be summed up in the word, moiety. The amount of good hay cut annually, would not probably exceed five tons; the remainder, if any, was cut along the margins of the brooks, and swales; consequently very little stock could be wintered on the farm. With the small amount of manure made, little attention was bestowed upon the cultivation of vegetables, or the cereal crops; these were the *external* features of the farm at the time of my purchase in 1846. I should here observe, that this purchase did not include the whole sixty acres. Recent additions of similar land have been made to the first purchase, and are included in the aggregate. The method which I pursued in the commencement of my operations, was the purchase of manure, from the stables in Cabotville, and applying it liberally to the soil for the growth of corn and potatoes, hoping, in this way, to warm and sufficiently invigorate such portions as I could annually manage by this process, to produce a larger crop of grass, after being seeded down with a crop of winter grain, or with oats, in the spring,—giving to each a top-dressing of leached ashes, at the time of sowing. This process was pursued for several years, until a large portion of the farm had been once, at least, reversed in its surface, but the results were not perfectly satisfactory. The balance sheet, after paying for the manure, ashes, and the cartage of them some two or three miles, with the necessary expenses of cultivation included, exhibited a balance which would hardly justify a continuance of this process. These applications soon lost their influence, and must be renewed, with similar results, or some more effective and durable appliances must be made. With this view of the subject, I resolved—against the dissuasive arguments and even ridicule of many whose opinions upon almost any other subject would have influenced my purpose—to commence operations with the use of muck. The evidence of an abundant supply near the centre of the farm would not incur much expense in the experiment, and if successful, would justify a

further prosecution. These inducements led me to have excavated several hundred loads of it, during the season when most available. This heap, after lying several months, was tried as a top-dressing, and harrowed in on land which had been ploughed for corn and potatoes. The results which followed this trial induced me to continue the experiment, and I speak with entire confidence, when I assert the success which has attended the use of muck, used in the form of compost, made with two loads of muck and one of green or unfermented manure, which is preferable; or the muck used alone, after being sufficiently digested in the heap. It is to the results of this practice which I have called the attention of the committee, in the examination of the farm, as more especially worthy of their notice, and indicated by the crops standing upon the ground at the time of their visit. I present no claim for originality of design or execution in the pursuit of this experiment, but present my farm with the improvements, which have been made by the most economical, and, I believe, judicious means, in my power. I give you a memorandum of the available products of the farm for the present season, which I think are not overestimated, and will exhibit the entire arrangement of the farm.

25	acres	mowing,—cut	.	.	.	50 tons of hay.	
3	"	wheat, yield	.	.	.	75 bushels	grain.
5	"	rye, "	.	.	.	100 "	"
4	"	oats, "	.	.	.	150 "	"
4	"	buckwheat, "	.	.	.	100 "	"
3	"	corn, "	.	.	.	150 "	"
6	"	potatoes, "	.	.	.	700 "	

The remaining ten acres are not available as tillage, but are available as a fund for the future improvement of the farm, in the article of muck, and other materials for the compost heap. In the use of stimulating materials for my crops, I have but little experience,—plaster answers well on some crops, but does not avail on many others, especially the narrow leafed grasses and the grain crops; vines, clover, and potatoes, are especially benefited by the use of plaster. I sometimes have tried, with signal benefit, a mixture of muck, hen manure, and

plaster, in the hills of corn, used at the time of planting. There was upon the farm, when I bought it, about forty apple trees. These have, in some seasons, added largely to the income from the farm, but are unproductive this season. I have enlarged the number within a short period past, by setting out about fifty more trees of selected fruit. I keep no stock on this portion of my farm, as it is some distance from my residence. I have not mentioned the value of the products, nor included in the account the straw of the grain, or the fodder from the corn; nor have I presented the bill of expenses attending the cultivation; the balance, however, is satisfactory to me, and will induce me to continue my present course of management.

West Springfield.

NORFOLK SOCIETY.*

The committee have been invited to visit but a single farm during the past year—that of the Hon. B. V. French, of Braintree. To describe this farm minutely and render a statement, in detail, of its cultivation, its products, its improvements, and their cost, is not, at this time, in our power. Indeed this can be done only by the respected occupant of the farm himself. Our visit, occupying the greater part of a bright summer's day, was entirely devoted to a view of improvements, made and in progress, which are, at once, upon a grand scale and of thorough workmanship—producing, where finished, results of rare beauty and utility.

Whoever wishes to see one of the best examples, in our county, of deep and thorough ploughing, trenching, and draining, or to understand the benefit of the practical application of science to labor, so as to give the highest culture and most attractive finish to a once hard, rough and rocky soil,—whoever is curious to know how immense bodies of granite can be expeditiously removed, and converted into massive, durable, and well-finished walls, or laid as covering for drains beneath

* The statement of the only farm that received a premium is embodied in the Report of the Committee.

the surface; or to ascertain how unsightly and noxious bogs, and well-nigh worthless swamps and meadows can best be turned into smooth and fertile grass fields, or prolific cranberry beds; or how a barren, sandy hill-side can be covered with nutritious food for cattle,—whoever would gratify his love of horticulture, and feast his eye and his palate upon delicious fruits and beautiful flowers,—whoever asks if it be possible that a farm of little promise and many disheartening features, can ever be made a scene of beauty pleasant to behold, easy to cultivate, remunerative of labor, and satisfactory in its whole results, let him go with your committee when next they are invited to visit this noble farm.

Observation afforded us ample proof that here was systematic, intelligent labor, under careful oversight and superintendence, of liberal outlay for desired results; of generous confidence in the laborer, and care for his comfort and improvement, and, in return, of sympathy with the employer, and a readiness to meet all his wishes; and of a daily record of operations and results, kept with business-like minuteness and accuracy, showing at once the cost and receipts, the products and improvements of the farm. Of the different classes of stock, we saw choice breeds of oxen, cows, horses and swine, which had been selected with the greatest care, and preserved with unsparing attention to their comfort, nourishment and growth. The farm buildings are all contrived for use—the most convenient and economical use—with no expense for mere ornament and show. In the barns and the sties cattle and swine are at home, and enjoy all the comforts of a proper home. In the house are apartments for the laborers, provided with every requisite for their ease and enjoyment. A well-warmed and lighted reading-room, furnished with many papers of the day, and with boo of scientific and general information, invites them to spend their evenings there; while, in another apartment, a large and well-selected library, containing many of the best agricultural publications, discovers the resort of the employer for that information which enables him so skilfully to direct the operations of the farm.

That the outlay and income of such a farm would more than

balance each other—if indeed so favorable a result as this were produced—we should not expect in the hands of most farmers. That it is profitable, under its present management, we have no good reason to doubt. But were it not so, we should still account the cultivator of such a farm a public benefactor. A knowledge of his modes of operation and their results would be a public benefit; and the imitation of his example, with judicious reference to the different circumstances in which it may be applied, would be a source of individual and public wealth and happiness. There are, besides the actual returns in dollars and cents, by which most men do, and perhaps ought, to estimate the present value of their lands, the satisfactions arising from the successful accomplishment of one's plans, bringing health and cheer; from the knowledge of superior means of support and comfort afforded one's laborer's; from the sight of valuable and permanent improvements made, by which others, if not one's self, will reap large benefit; stone walls that are built for ages, and in the construction of which it is difficult to imagine further improvement; waste, or almost worthless lands reclaimed and rendered bountifully productive; trees planted, from which generations are to pluck the choicest fruit; and the whole farm made beautiful by skill and culture. There is in these facts much to compensate any failure of remuneration in hard money, if such failure ensues. Then, too, in the case of Mr. French, there is another and higher satisfaction, the worth of which is understood by every mind possessed of right sensibilities. He cultivates and adorns, improves and preserves his paternal acres; the spot which was his early home, and is now endeared to him, beyond all others, by associations and remembrances of the purest and most inspiring sort! Who would not wish to preserve the soil on which his fathers trod and toiled, where his own first breath was drawn, from passing into stranger-hands? Who would not cheerfully labor through years of hardest business life, for means to be expended in reclaiming and enriching, in preserving and adorning the place, which shall go down, with his ancestral name, to future generations? Who would not love to be the benefactor of his own and his parents' neighbors and friends, while he lives, and to mingle his ashes with theirs, when he dies?

In this utilitarian age and community, such remarks as these may to most men appear absurd. Yet would we think it none the less our duty, in attempting to further the ends of an association like our own, to speak of such motives and encouragements to the farmer; to inculcate a high regard for the better sentiments and sensibilities of our nature; and to hold forth to the young the idea that there is something, besides money-making, to be estimated in the plan of one's life;—that there are more enduring and satisfying riches than the "golden ore," and that such riches lie within the reach of every honest and true-hearted laborer on the soil.

The following are the crops cultivated by Mr. French; the past season.

Tilled land:—

Two acres of peas; two and a half acres flat turnips; one-half acre sweet corn; one-half acre squashes; one and one-half acre mangel-wurzel and blood beets; two acres onions; one-quarter acre parsnips; one-half acre ruta-bagas; four acres cabbages; four and a half acres potatoes; one-half acre tomatoes; two acres carrots; two acres fodder corn; two acres miscellaneous crops in the garden—total, twenty-five acres.

We commend the example of Mr. French to the young and aspiring farmers of our county.

In conclusion, we would once more urge upon farmers the formation and generous support of town clubs, or associations for mutual encouragement and help. These clubs or associations are obviously needed, and may be made the sources of benefits which can hardly be overestimated. They may be particularly useful in a large part of this county by enabling the several members of them to avail themselves, at comparatively trifling cost, of a large number and variety of the best agricultural books and newspapers which a common fund might easily procure. Still further, they would, in much the same way, furnish many individuals the help of labor-saving implements and conveniences which their separate means would not afford, however desirable such help might be. The most intelligent farmers, and best managed farms, will generally be found where valuable agricultural books and papers are most extensively read; and the most thrifty and contented cultivators of the

soil will generally be seen, we believe, where the best implements and means for saving hard toil, and a too often limited time, are at hand.

CHARLES C. SEWALL, *Chairman.*

RECLAIMED MEADOWS.

ESSEX.

From the Report of the Committee.

The committee on wet meadows and swamp lands, have the satisfaction to believe that the subject intrusted to their charge, is one of vast importance to the farming community, and is, every year, more distinctly appreciated.

Although the number of claims presented for consideration is not so great as might have been expected in the county, still there are enough to present a distinct illustration of what can be done in the way of improvement, and to show the benefits that may be derived by doing it.

The several claimants have so fully stated the peculiarities of their operations, that the committee do not feel called on to go much into detail as to what they themselves have seen. And they are the more willing to be relieved of this duty, as by an unfortunate combination of circumstances in relation to the notices of the entries, made by some of the claimants, their opportunities for examination, while the crops were growing, were not so complete as could have been desired. Their opinions, therefore, of the comparative merits of the claims presented, are made substantially from the statements submitted, of which, all who read them, will have the opportunity of judging, as have the committee.

A few general ideas seem to be essential to be regarded in relation to lands of this description.

First, the surplus water is to be removed, and completely removed. While any of this remains, so far, at least, there will be an effectual barrier to improvement. Ditches or drains

for the conveyance of the surplus water are to be constructed, and so far as practicable, covered, the better to increase the surface for cultivation, and to remove the awkwardness of the excavations on the surface. This is particularly the case with ditches or drains for the shore springs, and cross ditches or drains running to the drains in the centre of the meadow or swamp operated on.

Drains laid with tile, made for this purpose, from two to four inches in diameter, at a cost of about four cents a foot, have come to the knowledge of the chairman, greatly improving the grounds on which they are laid. Without question, many parcels of what are generally denominated cold, spring land, would be doubled in value by properly laying one hundred rods of such drains to the acre. This mode of improvement has hitherto been but little regarded by Massachusetts farmers. It is coming much into use in Western New York.

As to the depth to which these ditches or drains should be made, much will depend upon the depth of the mire and the hardness of the bottom; generally three feet will be found quite sufficient to let off the water, if the meadow has ordinary slope or descent. There are few meadows that have not some avenue for draining that can be opened near at hand. Nature, when she built the one, took care to provide the other. There are few "dismal swamps," or "sloughs of despond," about the farms of New England.

Another consideration, in undertaking an operation of this kind is, how far is it expedient to carry gravel or other materials from the upland upon the surface of the meadow? Just so far, we should say, as may be necessary to give the surface, after the water is drained off, an operative firmness for sustaining the crops, and no further. We do not hold to expending twice as much, in covering the meadow, as it will be worth after it is covered; but would have all the operations in the process conducted with an economy that will pay; at the same time with a thoroughness that shall forever remove the meadow character from the land. We are particular to notice this, because we have more than once seen meadows pretended to be reclaimed, that would not stay reclaimed.

In our observations upon this class of lands, we have repeat-

edly witnessed the benefits of the application of fertilizing liquids, much after the manner mentioned in the well-drawn statement of Mr. Page, of the meadow improved on the Danvers town farm. If, as he proposes, the surplus fluids from the hog-yard and the receptacles of fertilizing materials about the dwellings, can be conducted and diffused over the two or three acres of grass land near by, we cannot doubt they will be amply sufficient to keep these lands in a condition capable of growing three or four tons of grass to the acre annually. We have seen, the present season, a field of ten acres, adjacent to a stable, where a large stock of animals was fed and stationed, so fertilized by the liquids accumulated in these stalls, as to add to the burden of grass at least one and a half tons to the acre—that is, to cause the entire field to yield three tons to the acre, when heretofore it has yielded only half this amount. This was on the beautiful farm of Richard S. Rogers, in Danvers, who, while he expends from his ample fortune freely on his greenhouses and his fences by the way, exhibits discriminating judgment upon his cultivated fields, and produces crops in great abundance.

One of the most interesting operations that has come to our observation on meadow lands the present season, was on the farm of Thomas E. Payson, in Rowley. He has fifty acres or more, adjoining, where the peat or mud is from three to seven feet deep, so situated as to be capable of being drained so as to admit a wagon with a common load of hay to pass on any part of it. Mr. Payson has cut narrow ditches about five feet apart, and thrown the mud on the beds between, and planted these beds with potatoes. In the autumn, when the potatoes were gathered, he threw the vines into the ditches, levelled the ground and sowed grass seed. Where he pursued this course last year, on about three-quarters of an acre, he cut three tons of good English hay to the acre the present season. In this way he contemplates bringing the whole into English mowing. The failure of the potato crop this year, by reason of the rot, prevented his forwarding his statement.

It will be observed that this improvement proceeds without carrying any material from the upland upon the meadow, except a common dressing of manure to start the potatoes. Conse-

quently it must be done, if effectually done, at much less expense than is ordinarily applied. The great difficulty attendant upon covered drains is the expense of their construction, unless there may be on the farm, at times, a surplus of hands, and the work can be done at odd jobs when other work is not pressing. Such, we understand, were the circumstances under which much of the labor was done, in the experiment on the town farm in Danvers.

The committee recommend the publication of the several statements as presented.

J. W. Proctor, *Chairman.*

Adino Page's Statement.

I offer for examination, and premium, (if thought worthy of it,) a piece of reclaimed meadow and run-land, situate on the town farm in Danvers, near the avenue that leads to the house, and easterly of the same. This parcel of land, previously to 1850, was usually known by the name of the "pond-hole." The peat mud was several feet deep over the greater part of it—in some parts the mire was ten or twelve feet. It was supplied with water by springs oozing from the surrounding highlands, and was often impassable, by man or beast, and so full of water as to have an offensive and forbidding aspect.

In the season of 1850, it yielded only about half a ton of the coarsest kind of meadow grass and rushes. In the autumn of that year, ditches were cut around the borders, so as to receive the water that came in from the hills; and cross-ditches were cut to an old ditch in the centre, that was cleaned out, so as to let off the water at the southerly end. These ditches were cut across about three rods apart, thereby forming the land into beds of that width, and were covered with stones and turfs, so far as convenient to do so. Where the land would support a team, the plough was used to turn the sod; in other parts, it was broken and turned with spades and hoes. Nearly all the surface was covered with gravel from the adjoining knolls, from one to twelve inches deep, according to position—making an average coating of material from the upland of five or six inches in depth. This was intermingled with the soil of the meadow, as thoroughly as it could conveniently be done.

In May, 1851, the land was again dug over and smoothed as far as practicable, and then planted with corn, in the ordinary way, with a common dressing of manure placed in the hill. The crop of corn was fair, being about fifty bushels of sound corn to the acre. It was partially injured by the frosts, the land being too cold for corn. After the crop was taken off, the land was levelled and smoothed, with the harrow and hoes. In March, 1852, it was sown with herds-grass and redtop, just when moistened with a coating of light snow. But the seed did not catch well, and the growth that season was light. In the spring of 1853, the grass started in a promising manner, and completely covered the ground. No addition of fertilizing materials was applied. It continued to grow luxuriantly, yielding an abundant crop of excellent grass. On the three acres, we cut between nine and ten tons of hay at the first mowing, and full three tons at the second, being an average amount of four tons to the acre, for the season,—the best hay product grown on the farm.

Some additional improvements have been made since, by completing the arrangement of the ditches, so as effectually to let off all the surplus water,—which is now drained to about eighteen inches below the surface of the land,—and by arranging conduits, or fluid conductors, from the backyard of the house, and the hog-yard, so as to convey the liquids from these establishments to the meadow, which being done, it is not easy to estimate the quantity of grass that may be grown thereon. It is safe to say that four tons to the acre can be grown annually, without any other dressing.

When it is considered that all this has been done on a worthless bog, without any extravagant expenditure, chiefly by the aid of the inmates of the house, I feel a pride in presenting it to the notice of the committee and society; both because of its being a valuable improvement on the farm, and as an exemplification to others of what patience and perseverance will accomplish. Having no personal interest in the matter, I feel that I may, without any impropriety, so far boast of what has been done.

Danvers, October 27, 1853.

I, Wingate Merrill, chairman of the Overseers of the Poor, in Danvers, having been fully acquainted with all the operations above detailed, the same having been executed with the approbation of the Board of Overseers, am clearly of the opinion that the crop, the present season, has not been overestimated by Mr. Page, the master of the house.

Royal A. Meriam's Statement.

In the year 1808, forty-five years ago, a piece of worthless meadow, the most worthless of any land on the farm, was operated upon, (probably one of the first efforts made in the county for redeeming bog meadows,) by covering with gravel and about two inches of loam from the roadside, and sowing down to English grass, and I have never known this land to produce less than one ton of English hay to the acre. This year, the crop was larger. A few bunches of meadow grass have occasionally made their appearance, which have been shaved off, perhaps half a dozen times.

In 1832, I engaged with some ardor in working over bog meadow, by levelling up a part of my garden, which bordered on a bog. Some more of the adjacent bog was, at that time, reclaimed; but I found that I was working at great disadvantage, on account of the superabundant water, and that I could not do much till my neighbor below should open a drain for the water. The land, being parsonage, had, like most of such lands, been suffered to remain in its native state.

Ten or twelve years ago, this parsonage land came into the possession of Richard Phillips, Jr., who took hold of it in good earnest, and opened a drain through for about one hundred rods, cleared off the bushes, and worked over the soil. Six or eight acres were thus worked over, two of which made an impenetrable swamp, inhabited only by reptiles and rabbits, and from which he cleared off and burned about two hundred tons of bushes and brambles, and, in the language of the workmen, "bulls'-heads," being bunches of serge grass, the bigness of a flour barrel, and half as high.

This piece of work is thought, by all observers, to be the greatest improvement that has been made in the town, of late years, the land being now as productive as any like quantity in

Topsfield. Some years since it was offered to our society for premium; only one of the committee, however, visited it, and, for some informality about the statement, it was rejected.

After Mr. Phillips had so clearly opened the way, I began, ten years since, the work of reclaiming wet meadow and swamp land, with which I was surrounded, being on a peninsula, and joined to him below. I opened a main drain through my meadow, and bedded up, by cross-ditches, about two acres, which I should not do again, the cross-ditches and bedding being unnecessary, grubbing and gravelling being better.

During these ten years, I have grubbed and gravelled over some half dozen acres of wet meadow and swamp land; making, together with that of Mr. Phillips, all in one body, twelve acres, which, from being unproductive, have not failed to produce, taken together, not less than one ton of hay to the acre, every year since. The hay is not the best stock hay, but sells well in the Boston market.

The meadow, which I now offer for consideration, has been reclaimed about six years. It was covered with bushes ten feet high, which were grubbed and burned, and the land seeded down with herds-grass and redtop, and it has produced two tons to the acre every year since the first. This year we estimated, by weighing one load, that the yield was three tons of herds-grass, redtop, and other grasses. The expense thirty dollars per acre. Twenty dollars worth of fuel was preserved from two acres, in pine stumps and roots.

Now, if the reclaiming of these half dozen acres within a stone's throw of our dwelling, added to as many more adjoining, all in full view of the public highway, and in the heart of the village, is no improvement, so far as dollars and cents are concerned, it is, at least, a relief to the eye, and a gratification to the taste and feelings of every good farmer who has had opportunity to observe the change. The damage to the health of the neighborhood, which so much stagnant water and putrefaction would make, must be certainly lessened. These reclaimed lands are exempt from some of the foul weeds of uplands. I have never seen white weed, lady's slipper, nor the Canada thistle, on these lands. They will always make

good returns for any kind of dressing, and are not affected by the season, but yield better, if any thing, in a dry season.

Topsfield, July 25th, 1853.

J. F. C. Hayes' Statement.

The meadow I have offered for consideration, comprises from one and a half to two acres. One year ago it was a mass of muck and brush—a forsaken spot. It was rendered wet by heavy springs rising in the margin of the meadow, which having no particular point of accumulation, kept nearly the entire surface of the meadow in a state of quagmire. I purchased this lot more for the water than the land; but, to render the water available, it became necessary to ditch the land. The ditching was commenced August 25th, 1852. As it progressed, I became impressed more and more with the idea of making something of the land. The ditching was completed, including deep cuts in various directions into the surrounding highland, and filling the cuts with stone at a cost of about one hundred and sixty dollars. The ditch through the low ground, probably, cost not above fifteen dollars.

The operation of ditching completed, that of clearing the ground of brush and wood was next commenced. This was done with an eye to economy, bordering on parsimony. Every stick of the size of the workmen's thumb, was trimmed and carted off for firewood. The small brush remaining, was piled and burned. The wood obtained more than paid the expense of clearing and ditching.

Having thus arrived at the bottom, my next idea was to put the meadow in a state of cultivation. My Irishman told me that the roots must be pulled out and burned. So also said the farmer, whose opinion I solicited. I was neither a farmer nor the son of a farmer, but I knew something of the nature of soils; and after getting the advice of many, I determined to follow my own inclination. The meadow on the north side of the ditch, I concluded to treat in the usual way; while that on the south side should be treated as I conceived to be the best way.

I accordingly commenced covering the stumps on the south

side of the ditch with turf, muck and loam, taken from the lot adjoining where Lowell Street has since been graded. The turf was cut by sharp spades, taken in barrows and placed bottom up, directly upon the top of the meadow. The loose earth left in taking up the turf, was then spread over the top of this turf, and made level with a hoe. This done, the labor of reclaiming was completed for the time being. In this condition, with no manure, and without ploughing or spading, the ground was planted last spring. It has produced good corn, peas, beans turnips, ruta-bagas, cabbages, carrots, parsnips, &c. Indeed, every thing has grown luxuriantly, except the onion; the potato grew finely until the rust put a check to it.

The cost of covering is, perhaps, something greater than that of clearing. But it is the best way, for the reason that whatever ammonia is found in wet land, as is this of mine, like the cream upon a pan of milk, must be near the top. Hence, if we remove the turf, the best portion is taken away. By putting the top of one lot upon that of another, its natural productiveness must be increased. The effect of this mode of procedure, is best told by the produce. The produce of the covered, compared with that of the cleared portion of my ground, is at least four to one. The covering process is quite effectual, in killing the growth of most kinds of brush wood. The elder and sweetbriar alone, have made their way through the turf, and coming as they must through several inches of earth, they are easily pulled out by the hand, or yield readily before the hoe. The cost of covering an acre of ground to the depth of six inches, when the run for the barrows is not over fifty feet, on an average for the lot, cannot exceed fifty dollars. The covering of my lot cost even less than this, as the weather was "freezing cold," during most of the time it was being performed, and each man made rapid work for the comfort of it.

Mr. Stowell will carry to the fair, samples of the various kinds of vegetables raised on the above patch of ground, during the present year. Next year we shall cultivate with the aid of manure, and with more system, apportioning to each vegetable its proper limits.

Lawrence, September 10, 1853.

Mark H. Davis's Statement.

I submit for consideration my operations on one acre of meadow land on the farm of Lewis Allen, in Danvers, that has been under my care and improvement for three years last past.

In July, 1850, I began to invert the sod by the use of a plough, but the mud was so soft that the oxen could not stand in the furrow. Consequently, I made use of a pair of wheels that the oxen might travel on the sward, and then I cut the furrows to the depth of ten or twelve inches. This meadow has a peat bottom—some parts of it are so soft that I could work only in the driest part of the season. In September, 1851, I put a coating of tanner's manure, in which were mingled hair and lime, on about half the lot, and sowed herdsgrass and redtop thereon. In July, 1852, this part, measuring seventy rods, yielded one and three-quarters tons of hay, of first rate quality, as estimated by those who saw it.

In August, 1852, I prepared the remainder of the lot, by applying barn and night manure; the difference was observable all the season—the appearance being much the best where the barn and night manure were used. I have taken from the ditches fifty cart loads of mud that I estimate to be worth fifteen dollars, for upland dressing. The crop was injured the present year, by the heavy fall of rain, about the 25th of May, which caused the water to overflow and stand upon some parts of the land, the effect of which was perceptible all through the season.

I have sold 4,310 pounds of hay from the land for .	$45 96
And have left what I estimate half a ton at . .	10 00
Making the entire product of 1853 to amount to .	$55 96
The product of the previous year was sold for .	36 00
Amount of product for two years	$91 96

I estimate the expense incurred as follows:—

Labor, ...	$14 00
Manure, ...	10 00

Grass seed, ...	$2 52	
Cutting and making at $2.50 per ton, .	11 25	
		$37 77
Net income of the land, ...		$54 19

Danvers, September 28, 1853.

Stephen Blaney's Statement.

I present for inspection and premium, (if thought worthy of it,) a piece of reclaimed swamp, containing one and a half acres. It is situated in Salem, near the Sheep Pasture, (so called.) About six years since, it was a coarse, rough, unproductive swamp, of alders, blueberries, and other bushes, with more hassocks and holes than could well be counted, and a sufficiency of water to render it impassable for man or beast. These bushes were cut and cleared, and the surface left naked, and as unsightly and forbidding as possible.

Early in September, 1852, I cut a two-foot ditch through the centre, to let off the surplus water. I then carried on gravel and loam, from the shores adjoining, about two hundred cart loads, and filled the holes and cavities, so as to make the surface as even as I could. I applied about twelve cords of compost, made of glue grounds and meadow muck, about equal quantities of each; spreading it uniformly over the surface. I employed M. H. Davis, two days, with his team of three cattle, and inverted the sod to the depth of ten inches, and afterwards I picked out the stumps and roots, and smoothed the surface. Eight cords of compost, collected from the refuse about my wool and morocco factories, were then applied and mingled with the soil, by the use of the harrow. Mr. Davis then sowed it down to grass, using two bushels of redtop, and three pecks of herds-grass seed. A brush was used to smooth the surface, it being too soft to support the roller. The work was thoroughly and neatly done, and thus far, completed in September last year. The seed sown came up thick and promised well.

In July the present year, I mowed and sold the first crop, being 4 tons 1,170 lbs., on the ground, at eighteen dollars per ton. Subsequently, I mowed and gathered to my barn, a second crop of two and a half tons, of first quality fodder.

The whole amount of hay gathered from this piece, of one and a half acres, in one year, after the turf was inverted, was seven tons, 170 lbs., or four and two-thirds tons to the acre. I estimate the value of this hay, as it now sells at twenty dollars per ton, amounting to $141 70

Incidental expenses, viz.:—

Grubbing, smoothing, and clearing, fifteen days' labor, at one dollar per day, . . .	$15 00	
Paid for ploughing, ...	7 00	
Compost applied, estimated at . . .	20 00	
Paid for grass seed, ...	4 25	
Labor in curing the crop, at two dollars per ton, ...	16 50	
Other services on and about the field, carrying on the manure, &c., say	10 00	
Total amount of cost of cultivating, . . .		$72 75
Balance, net income for the year, ...		$68 95

I estimate the land worth three hundred dollars an acre, (because it will command that price.) Before I commenced the improvement it yielded nothing. If any of the farmers—for I do not profess to be one—have done better with their lands, I should like to see how it has been done. Those who saw the grass growing, of whom were several intelligent observers of such culture, spoke of it as being as successful an experiment as they have ever seen.

Salem, November 14, 1853.

James Taylor's Statement.

The piece of bog meadow to which I invite your attention, contains about thirty-three acres. I bought the lot in 1847, for which I paid twelve dollars an acre. This meadow had formerly been covered with a heavy growth of wood, consisting of maple, birch, and spruce. The principal part was cut off about six or eight years ago. There was some wood on a part of it that I cut, that brought me one hundred and sixty-eight dollars, besides paying for chopping.

I began ditching in 1847, and finished in 1852. I began to bog in 1848 and finished in 1853. I have dug four hundred and eighteen rods of open ditch at a cost of 20 cents per rod, ...	$83 50
150 rods of blind ditch at 50 cents per rod, . .	75 00
I have bogged 23 acres at a cost of $28 per acre, .	644 00
	$802 50
In 1849, I planted five acres with potatoes. I put thirteen loads of compost manure to the acre, in the hill, on four and a half acres, at a cost of one dollar per load, $50. I dug the potatoes the last of August, and the first of September, which I sold on the ground for $85 an acre, ...	425 00
I calculated I lost eighteen barrels, besides, by rot. In 1850, I planted eight and a-half acres of potatoes. I manured four and a half acres with compost manure, twenty loads to the acre, cost one dollar per load. I sold the same in June, as they were, for fifty dollars an acre, ...	425 00
I planted half an acre with corn, put on seven loads of compost manure in the hill, had twenty bushels of corn, ...	20 00
	$445 00
In 1851, I planted two and a half acres with corn. Spread on twenty loads of compost manure to the acre, cost one dollar per load. I had forty-five bushels of good sound corn to the acre, . .	112 00
Cows' fodder, ten dollars per acre, ...	20 00
Planted seven and a half acres with potatoes without any manure, which I sold on the ground, after being dug, for eighty dollars an acre, ... I calculated I lost besides, by rot, ten barrels.	600 00
In the fall of 1850, I sowed down six and a half acres to grass, with half a peck of herds-grass and one peck of redtop to the acre. This fall I cut twelve	

tons of hay that I sold at the barn for ten dollars a ton, ...	$120 00
I fed the rest, and considered the feed worth . .	20 00
	$872 00
In 1852 I let four acres for, ...	65 00
I planted six and a half with potatoes without any manure, which I sold on the ground, after being dug, for seventy-five dollars per acre, ...	487 50
I planted two-thirds of an acre with corn without manure, had thirty-five bushels of good sound corn,	35 00
Sold the fodder for $8, ...	8 00
Cut on the six and a half acres of grass ten tons of hay, which I sold at the barn for eighteen dollars per ton, ...	180 00
Feed, ...	20 00
	$795 50
In 1853 I let seven and three-quarters acres for, .	215 00
I planted five and a half acres with potatoes, which I sold on the ground, after being dug, for fifty dollars per acre, ...	275 00
I calculated I lost forty barrels, besides, by rot.	
I sold the grass standing on the six and a half acres for	184 00
	$674 00
Calculated the feed worth, ...	40 00
	$714 00
Last winter I put on to the six and a half acres of grass two hundred and sixty loads of clear gravel, and one hundred and thirty loads of compost manure, which is the first that has been put on since it was sown down; the expense of putting on this gravel was $70; compost $130, ...	200 00
Other incidental expenses, ...	100 00

In 1851 I sold to my brother about thirteen acres for $600, and twenty acres left, which is all bog.

CARLISLE, September, 1853.

WORCESTER.

Statement of T. & I. S. Meriam.

We have two methods of reclaiming our swamp lands. One is to plant potatoes, and cultivate the swamp in this way for two or three years until the old turf is fully rotted—using care to take all roots and stumps out, so as to be able to leave a smooth surface at the time of seeding, which is usually done in the fall as soon as we can get the crop of potatoes off. The other is to cart or sled on gravel in the winter when the swamp is frozen enough to bear up a team; we have about five acres reclaimed in this way, and two reclaimed in the other manner. But as we did not call the attention of the committee to but two pieces of improved swamp, we shall confine ourselves to them. They contain about one and half acres each.

The lot which we shall call No. 1, was covered over with gravel in the winter of 1845, about five inches thick, spread at the time of carting; there being but little snow at the time, we could spread it even. We seeded with herds-grass and redtop the last of March following, using one peck and a half herds-grass, and half a bushel of redtop to the acre. The first season, we had but little hay, but it was very thick. In 1849 we applied about six loads of compost manure to the acre, and have cut about two and a half tons of hay to the acre every year since 1847. Cost of gravelling was forty-four days' work for one man and one yoke of oxen, in the short days of winter, and after taking care of a stock of cattle; we think that fifty cents a day for man, and the same for oxen, a fair price, so that the expense was but $44 for the one acre and a half.

Lot No. 2, contains one acre and a half, that has been planted three years with potatoes. In February, 1849, we sledded on twenty loads of manure from under the stable—it was frozen at the time, and we think it would not have been over fifteen cart loads, such as we usually get out in the spring. This piece had been mowed the year before, although we got the

very poorest kind of grass where it was not covered with brush and stumps. We dropped the potatoes on the top of the stubble, put the manure on, planted in drills, and turned the turf on to the potatoes with spades, and did nothing more to them until we dug them—we dug one hundred and thirty bushels of potatoes. Labor of two men five days each, at eighty-five cents a day to plant, and two men four days each at eighty-five cents a day to dig them. We planted again in 1850, at about the same expense for planting and digging, but as the potatoes rotted badly, we obtained only about twenty-five bushels of good potatoes. Have used no manure on the lot since the first year, except plaster at the time of planting. In 1851 planted again to potatoes, at about the same cost as the two other years, and had one hundred and forty bushels of good potatoes, which were dug early in October. We then seeded down to grass. In 1852 we mowed it and got about two tons of hay. In 1853, this season, we obtained, as near as we could estimate it, four and a half tons from the acre and a half.

We have improved our interval or meadow land by ploughing it the last of August or first of September, using care to turn the sward over smooth, and when it cannot be well done with the plough, have it done in some other way, but have it done, and then have it well rolled; put on twenty cart loads of good manure to the acre, spread evenly, and sow the hay seed—using about one peck and a half of herds-grass and a half a bushel of redtop to the acre. Harrow thoroughly lengthwise of the furrow and roll it down. We have usually got two tons of hay to the acre the first year, and not unfrequently two and a half tons.

We have another piece near the road of about four acres which, a few years since, was covered with bunches of brush and produced but very little grass. We have cleared off the brush, ditched it and smoothed the surface with the plough, seeding down in the fall. We irrigate it all we can with a small stream that runs through it, and now it is a fine piece of mowing, and produces a good crop of hay.

AUBURN, October 24, 1853.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of Edmund Smith.

The piece of swamp meadow which I offer for your attention is situated in the east part of Hadley, containing nineteen and a half acres. I purchased it in 1840, for twelve dollars and fifty cents per acre. Six acres, at the west end of the lot, was swamp mowing land, except an acre on the south side, which was called "high land," fit for tillage. These six acres had been rented for nine dollars per year. The east part of the lot was a brush pasture. This piece of land lies at the south end of a large tract of swamp—being the lowest part. The water stood in so large a quantity in the spring of the year, that nothing of any value would grow. In October of 1840, I mowed the brush on four acres on the south side of the pasture and ploughed it. The next May, it was planted with corn, manured in the hill, and a good crop was secured. Oats and hay seed were sown the next season, and a good crop of oats followed. It mowed well the next season. I made a ditch across the lot north and south—in 1842 I think—which took off a great part of the water from the meadow. I think it was in the last of May, 1843, that I ploughed two acres of this low meadow. The furrows drained it to the south, and a ditch then conducted the water to the main ditch. Potatoes, manured in the hill, were planted, yielding a good crop. The next spring I spread on manure, cultivated and harrowed in oats and hay seed without ploughing. The oats were light, the hay came in well. This piece of land I mowed six years, obtaining a ton and one half per acre, yearly. I mowed the brush in 1843, the last part of the season, on three acres east of the ditch in the lowest part of the land on the lot. Two years after mowing the brush, I mowed the land on which the water stood through the spring and first part of the summer, in such quantity that the hay mowed was of no value. The season in August, 1845, being very dry, I dug the stumps on this three acres, and put them into a fence. In the same month I ploughed this piece of land with four yokes of oxen and a large plough,

turning the furrow handsomely ten inches deep, and occupying eight days with the labor. The lands were four rods wide; and the furrows drained the water to the ditch which crossed the lot, and left the land dry. The next spring it was sowed with oats, herds-grass, redtop and clover seed, producing a good crop of oats. The grass seed took well, and yielded a ton and one half of good hay, to the acre, for five years after it was seeded, without any manure. Three years ago I planted three-quarters of an acre of this land with potatoes, manured in the hill, producing a good crop. The next spring it was sown with oats, seeded with grass seed without manure; and the two last seasons I have mowed at the rate of two tons of good hay, to the acre. Last fall, the remainder of this piece was ploughed, and about the middle of May last, planted with Indian corn, manured in the hill with seven cartloads to the acre; five bushels of shell lime and half a bushel of plaster to the acre, dropped in the hills. I think there were sixty bushels of shelled corn, to the acre.

Five years ago, I made a ditch sixty rods on the north side of the lot, as far east as the woods, which helps the north side of the lot very much. There is one acre and a half of woodland on this lot, eighteen acres mowing and tillage land. I have, for a few years past, planted three or four acres, and sowed about as much with oats, and seeded with grass seed. The crops on this eighteen acres last year, were ten tons of good, and four tons of poor hay, one hundred and fifty bushels of corn, and thirty bushels of oats. The crops this year, were one hundred and seventy-five bushels of corn, one hundred and fifty bushels of oats, twenty bushels of rye, eight tons of good hay, and three tons of poor hay. The wood paid for the labor of cutting the brush—one acre which I cleared, yielding very good wood. From the remainder, the wood and timber had been cut off, and it had grown up to alders and white bushes, covered with moss.

Hadley, Nov. 8th, 1853.

HAMPSHIRE.

Report of the Committee.

The word meadow, in its first sense, signifies flat, depressed land, generally lying upon the banks of a brook, or river; as for example, the meadows on the banks of the Connecticut River, or upon Muddy, Flat or Beaver Brooks in the eastern part of this county. Meadow land does not, necessarily, imply wet land, neither does it exclude such, as those will admit who have observed the grounds situated near the streams here named. Meadow is sometimes, though improperly, used as a synonym of the word swamp, signifying low, spongy ground, soft in consequence of the water's being suffered to remain, where draining has not been employed to remove it. These are usually seen interspersed among the hills of the four western counties of this State. The term swale is used among the farmers in the same sense as the word swamp, as here defined. Such land, as is indicated by the words swamp and swale, has been regarded as more or less valuable, according to the quantity and quality of the grass produced. It not unfrequently holds the water that falls upon it, as well as that which runs in from the surrounding hills, bringing down, often, the choicest mineral elements of the soil, which sink beneath the water, and are thus rendered nearly worthless until the water is drained off.

The more solid matter, found in a swamp, when drained is, sometimes, peat; a substance of vegetable origin, more or less saturated with water, consisting of roots and fibres in almost every stage of decomposition, from the natural woody substance to the almost perfect black vegetable mould. Mr. Shipman's reclaimed swamp, in Hadley, furnishes one of the best specimens of this quality, that has come under the observation of the, committee.

Mud, such as is found in some of these swamps, is a moist soft earth, differing essentially from peat. Swale mud is more thoroughly decomposed than peat, and resembles it less than it does muck, a decomposition of vegetable matter—more completely disorganized than peat. It is not so easy to draw a

dividing line between swamp mud and muck as it is to use the two words. The difference between them and peat is very distinct and marked. Mud and muck seem, generally, to be so entirely disorganized as to leave scarce a trace of vegetable substance, and, in some cases, none whatever. The mud in the lowest parts of the land bordering upon the brooks, in the eastern part of this county, is of this kind, and is so deep that a hay-pole, twelve feet in length, may be pressed into it without touching bottom.

Whether these mud swamps will ever be drained, it will be, probably, for some future generation to determine. If the work is ever accomplished, it will be done by great expenditure of money and labor. When drained, they will furnish most valuable lands for tillage, which, in their unreclaimed state, are nearly valueless, except as a dwelling-place for toads, frogs, snakes, moles, snipes, woodcock and blackbirds. Alas, for this numerous hoard of swamp aborigines, when these low lands shall be reclaimed from the dominion of water, and turned into rich fields of the very best tillage land, of which New England can boast. This is no groundless speculation. Mr. Shipman's reclaimed land, in Hadley, is, this very day, worth more per acre than the very best meadow land in the world-renowned Connecticut Valley, for the reason, that a given amount of labor and manure will produce more tobacco, more Indian corn, or broom-corn, or potatoes, than the same expenditure will yield on the best alluvial on the river of pines. Such a fact should cause every man who owns a peat swamp to smile in view of his treasure. For, when drained, it may be rendered not only very productive, but will furnish, also, material to reclaim worn-out old fields. Many are beginning to believe that these lands, that have been deemed worthless swamps, are the most desirable for improvement.

The day is not far distant when a good farmer will be ashamed of his neighbor, whose unreclaimed swamp furnishes a dwelling place, through the warm season, for croaking frogs, toads and peepers. The time is at hand, it is hoped, when all the swamps and swales of Massachusetts will be drained and tilled, and thus rendered productive. Many acres in this county have already been reclaimed, and made to bear much produce.

There are more, however, that remain unreclaimed and unproductive.

Four entries, of what were called reclaimed meadows, were made. The committee viewed them all. Only two pieces came within their province, to wit, those entered by Messrs. Montague and Smith.

L. WETHERELL, *Chairman.*

Statement of Albert Montague.

I offer three acres of reclaimed meadow in Sunderland. I can give an accurate statement of the method and expense of reclaiming only one acre, and of the amount of produce obtained therefrom. The entire piece lies in a swamp of about ten acres, which has been partially drained, from time to time, since 1833. By draining at considerable expense, and overcoming opposition of neighbors, who were not willing, at first, that I should cut a drain through their lands—although their lands became twice as valuable in consequence of the drain—this whole swamp has been very much improved, and yields much good feed, as well as much that is sour. My lot of three acres, to which I invite your special attention, lies near the south end of this swamp, being as low as any part of it. I mowed it for a series of years previous to 1852, and obtained a little coarse bog hay, barely sufficient to pay for my labor.

In August, 1851, immediately after mowing, I commenced draining more faithfully, and bogging it evenly, to fit it for the plough, as most of the stumps had already been removed. I then ploughed, about seven inches deep, taking pains to have it well turned, and the furrows lie nearly flat. I turned up some two or three inches of muck, which lay until May, 1852, and being then well pulverized with a harrow, I was enabled to cultivate it without much expense.

I planted on the 22d of May, spread a light coat of manure, composted of barnyard manure and sand, in equal proportions, using at the rate of eight loads of compost to the acre. I added twelve bushels of ashes to the acre, putting them in the hill. I planted Indian corn, hoed three times, and cultivated between the rows. Just before the last hoeing, I sowed grass seed at the rate of one peck of herds-grass, four quarts of red-

top, and five pounds of clover to the acre, and mixed in a little turnip seed. I cut my corn September 18th, and husked about the middle of October, one hundred and fifty-seven bushels of good ears of corn, on one acre, and about three tons of corn-fodder. The weight of the fodder was obtained by weighing one stack, and multiplying it by the number of stacks. I finished pulling my turnips the 20th of November, and had one hundred and twenty-five bushels on one acre. In July last I cut a fair crop of good hay, estimated by competent judges at two tons to the acre. I think I should have had a greater crop, had the season been favorable. The muck was dry enough to burn well a long time before the grass was cut. The land is now in good condition. The grass thickens so well, that I expect a heavier crop of hay next season. I have computed the expense of reclaiming one acre from its condition—in August, 1851—when it was drained and the stumps removed.

Produce:—		
78 bushels corn, at 83⅓ cents, . . .	$65 00	
3 tons corn fodder, at $6, ...	18 00	
125 bushels turnips, at 12½ cents, . .	15 62	
2 tons hay, at $7 per ton, ...	14 00	
		$112 62
Expenses:—		
Bogging and moving bogs, ...	$6 00	
Draining, ...	3 00	
Ploughing and harrowing, ...	6 00	
Manures, compost and ashes, . . .	10 00	
Planting and hoeing three times, . .	5 00	
Grass seed, ...	1 50	
Corn, ...	6 00	
Turnips, ...	3 00	
Hay seed, ...	2 50	
		43 00
Net gain on one acre, ...		$69 62

To this might be added the value of the land, or nearly so, for before I commenced in August, 1851, there was no net increase from it—the bog hay barely paid the labor of getting it.

Statement of Edmund Smith.

The piece of meadow which I offer for premium, contains about three acres, in Hadley. It is the centre of a lot of nineteen acres and a-half, which I bought in 1840, and which was then worth five dollars per acre. There was some wood on the north side—the south side was higher, and part had been ploughed. In 1842 I mowed the brush to see if I could make a piece of swamp-mowing; but it proved worthless, in consequence of the water flowing from a large tract of swamp on the north side. It was so wet, that nothing grew of any value. I had cut a ditch, west of this piece of land, running north and south across the lot, which took off some of the water. The season was very dry in August, 1845, and I thought I would try the experiment of ploughing. I dug the stumps and put them into a fence—used a large plough, drawn by four yoke of oxen, and had a man with a hog hoe to relieve the plough whenever it clogged or stopped. We were eight days ploughing three acres, ten inches deep, beds four rods wide. The furrows drained off the water into the ditch on the west side. The next spring I sowed oats and hay seed, at the rate of eight quarts of herds-grass, three pounds of clover, and four quarts of redtop seed to the acre. The crop of oats was better than I expected. The hay seed came up well. For four or five years after it was seeded, I think there was at the rate of one and a half tons of hay to the acre, worth six dollars per ton, standing. The north land—about three-fourths of an acre—I ploughed and planted in the summer of 1850, with potatoes and broomcorn, manuring in the hill. The next spring I sowed oats and hay seed—had a good crop of oats—the hay seed came up well. I cut from this piece, the past two seasons, at the rate of two tons of good hay to the acre, and have never manured it, except in 1846. The remainder of the three acres I ploughed last fall, about eight inches deep. It was planted in May, and manured in the hill with oyster shell lime and plaster. I think the crop equal to fifty bushels or more of shelled corn to the acre. The land, since it was first planted, has yielded a yearly income of six dollars per acre; but the last two years the income has been greater.

Result:—		
Present value of the land, $50 per acre, . . .		$150 00
Expenses:—		
First cost, at $5 per acre, . . .	$15 00	
Clearing brush and stumps, . . .	20 00	
Ploughing, ...	30 00	
	——	$65 00
Net profit, ...		$85 00

HADLEY, Mass.

HAMPDEN.

Statement of S. F. Merrick, Jr.

The meadow offered for your inspection is a low, irregular swale of eight acres—about one-half of the work is completed.

We commenced, August 11, 1851, by digging a main drain in the centre, six feet wide, eighteen inches at the lower end, and gradually increasing to the depth of between four and five feet. The muck varied from eighteen inches to four feet; care was taken first to bog the sides of the ditch, as it makes it easier to remove the bogs and earth. The bogs and muck were thrown on one side; the gravel opposite. The banks were cut almost perpendicular, to increase the quantity of gravel and to secure the greater durability of the drain. The next object was to drain off the water that came in from the side; although there is considerable fall, so great was the quantity, that it destroyed nearly all vegetation except moss; and there was plenty of that, and now and then a patch of cranberries. Near the lower end of the main drain we commenced an under-drain (digging it as narrow as could be conveniently worked) running at right angles with the main drain directly to the upland, quite into the hard and solid ground. Experience has taught that the nearer the upland (within certain limits) the nearer will the water be to the surface, and the less hard pan to penetrate. This ditch was dug the same depth with the main drain, and increasing, as we neared the upland, to the depth of five or six feet; we intended to go down to quicksand the whole length

of the drain; this ditch was then laid down with stone chips, but they were afterwards mostly taken up and tiles put in their place; stone will do in hard pan very well.

After this ditch was complete, the land was bogged, the sand from the main drain spread, and by the aid of scraper and shovel, well covered with loam and sand: a large part was ploughed; it was then all well dragged, at least two days to the acre, a light coat of compost or fresh manure added; then stocked, dragged and bushed. We then raked all the light sods and roots with a hand rake and the work was complete. We experienced more than ordinary difficulty on account of having to keep the water at a certain height to convey to another meadow below for irrigation. We ran the under-drain along the bank till the fall decreased so as to render it advisable to have recourse to the main drain by another perpendicular. We find the best course to pursue is to mark out by an under-drain as much as can be completed in one season, and then commence again at the main drain. We find where the land is not ploughed it is necessary to cut the bogs very close, or rather to completely skin the land. We find it better to plough ever so slightly, as the sand can be more readily mixed with the soil, and if dragged in the right state the turf will all drag to pieces, and that which will not drag to pieces, ought always to be removed. Bogs will grow in quite a dry soil, if they be well rooted; therefore it is quite important to thoroughly subdue the old sod before you attempt to make a new one. I have numbered the pieces as they were finished. No. 1 contains about three-fourths of an acre, lies between the main drain and a drain that conveys the water along the upland to a meadow below not ploughed; sanded by spreading the bank of ditch; finished sometime in October, 1851; seeded one-half pound Timothy, one-half pound festuca-pratensis; the festuca somewhat killed out but came in to redtop and June grass.

But in 1852, twenty-five large cocks, being light and leafy, would not weigh over ten hundred. In 1853, cut thirty-five hundred, and a large crop of rowen now on the ground.

No. 2 contains over an acre, lies opposite side of main drain with under-drain along bank; was partially fitted in the fall.

Mostly ploughed and fitted in the spring of 1852, stocked with millet, herds-grass, festuca, clover, and blue grass, (I never intend to sow any more clover on meadow land,) had a large crop of millet averaging six feet in height. Cut in 1853 three large loads, over two tons of hay, and a heavy crop of rowen now on the ground.

WILBRAHAM, Mass.

HOUSATONIC.

Report of the Committee.

There were eleven entries of lands in the year 1850, all of which your committee viewed in the autumn of said year, and have again viewed said lands the present season.

The whole quantity thus presented for our consideration, will not vary much from seventy-five acres, a majority of which was partially drained, and other portions of the work of reclaiming more or less in progress at the time of our first view in 1850.

Another portion of said lands was quite thoroughly reclaimed, having had crops of grass and other productions either taken off or growing upon them at that time.

The improvement of the latter portion of said lands was very praiseworthy and valuable, but your committee do not consider them as coming fairly within the rules and regulations of the society as competitors for premium. We have not, therefore, taken into account those pieces of land which were nearly or wholly reclaimed and made productive before your society had taken any action on this subject, believing it to be the intention of the society that the improvements should be nearly, or wholly made after they were entered to the secretary of the society as competitors for premium.

In their action on this subject, your committee have endeavored to keep in view the most expeditious and economical method of reclaiming these lands to a state of productiveness and value.

We have found it difficult to form a satisfactory opinion of what is the best, most economical, and quickest method of

accomplishing the end in view, owing to the great variety of soils, and obstacles to be overcome; they being quite as valuable and numerous as the pieces of land which have come under observation.

Those which we have viewed, with a single exception, after having been drained and the bogs and brush cut off, have been subdued by repeated ploughing and harrowing, which is a very slow process of reducing the foul grasses and other substances, and the unyielding qualities of such soils, more particularly when there is great dampness, which is most usually the case in such lands, be they ever so thoroughly drained.

This may be a good method where there is little inclination to wetness in the soil and not much inclined to coarse grasses and bushes. But where these obstacles do exist to much extent, your committee are fully of the opinion, that after thoroughly draining, the best method is to float or cut off the whole surface of the ground, throw it into winrows, and burn it on the ground. This method, although it may appear very slow and expensive, we are satisfied is the quickest, the most thorough, and taking all things into the account, we believe to be the most economical mode of reducing such lands to a state of useful productiveness.

The ashes, which will be produced in great quantity, when spread upon the soil, afford the best of manure which can be produced. All the coarser materials of the land are at once reduced by fire, and are not only more useful as a manure, but are more thoroughly subdued and reduced than in any other way. The surface, with slightly ploughing or thoroughly harrowing, is much earlier prepared for a crop than by the other method, gaining one or two years out of three or four in the use and production of the land over that of subduing by the plough. Your committee, from the limited observation which they have been able to make, would not fail to recommend this method of reclaiming lands of this character in preference to any other, always keeping in view that the land should be thoroughly drained before the operation is commenced.

We believe that the premiums offered by the society for the reclaiming of such lands, are having a beneficial effect, and are operating as a stimulus to those who possess them, to exert

themselves to bring them into a state of productiveness and value.

Your committee have awarded to Mr. Orange Smith, of Egremont, the first premium of $15, for the greatest improvement on five acres of wet, swampy, unproductive land, by bringing the same into a state of productiveness.

Mr. Smith's improvement embraces between seven and eight acres in quantity. This land, was, on our first view, wholly unproductive. From his representations, after he had drained the land and cut off the brush and bogs, and dug and carried off the stumps and roots, the remainder of the work was mainly done with the plough and harrow. The amount expended, including board of workmen, grass and other seeds sown, about $200 00

The amount of the value of crops taken off the same land up to this time, exclusive of a crop of buckwheat, now on a part of said land, which is unpromising owing to the season, amounts to about $75 00

$125 00

Leaving a balance against him of $125, or about sixteen dollars the acre. The land is now seeded to grass, and bids fair to be productive in future.

We further award to Frederick F. Cooper, of Sheffield, for the greatest improvement on three acres of such land, the sum of $10.

This is a part of a swamp of thirty acres, which Mr. Cooper has now under process of reclaiming, which, after cutting off the bogs and draining, was mainly performed by the plough and harrow.

The expense, as rendered by Mr. Cooper to us, including grass, and other seed, is . . $50 90

The crops taken from the land within three years, he estimates at 64 00

$13 10

Leaving a balance of $13.10 in his favor, after paying all expenses.

We further award to Mr. Harvey Royce, of Sheffield, a premium of $5 for the greatest improvement of one acre of such land.

The improvement of Mr. Royce embraces about one and one-half acres in quantity, on our view in 1850. The surface was covered with a very thick growth of white-bush, coarse grasses and brakes; the soil a deep muck, and wholly unproductive; the water wholly taken off by draining. The manner of reclaiming this piece of land, as given us by Mr. Royce, was by wholly paring off the surface, throwing it into winrows and burning it on the ground, and spreading the ashes over the land, and harrowing it over and sowing it to grass seed. This was all done the last fall, or in 1852, and he has cut a crop of hay from the land this season, of one ton to the acre. It is now in good turf, and bids fair to be very productive, more thoroughly reclaimed, to appearance, than any piece we have viewed.

The expense of ditching, cutting, pulling and burning the white-bush, &c., including grass seed, is	$25 62
Crop taken off this season estimated at . .	7 50
	$18 12

Leaving a balance of $18.12 against him, or $12.08 the acre.

All of which is respectfully submitted,

RALPH TAYLOR, *Chairman.*

BARNSTABLE.

James G. Hallet's Statement.

The piece of reclaimed meadow which I present for premium, is the upper part of about five acres, which I diked in three years since, which at that time did not produce half a ton of any kind of hay. The manner of treatment has been as follows:—the first year it was ploughed and planted with potatoes, and the next spring put down to grass. On the outside of my barn I have a vat forty feet long, eight feet wide, and four and a half feet deep, which is water tight and receives all the urine and liquid excrements from the cattle, which are stalled every

night through the year. Into this vat I carted red sand and allowed it to remain until well saturated, and then applied it as a top-dressing. The result is below.

YARMOUTH PORT, July 23, 1853.

This is to certify that I have measured a piece of reclaimed meadow belonging to James G. Hallet, which he presents for premium, and find it contains one hundred and twenty rods.

CHARLES THACHER, *Surveyor.*

YARMOUTH PORT, October, 4, 1853.

This is to certify that we have weighed the hay cut on the piece of meadow measured by Charles Thacher, Esq., belonging to James G. Hallet, and find it four tons, sixteen hundred and twelve pounds.

DANIEL CROCKER, & Co., *Weighers.*

IMPROVING PASTURE LAND.

ESSEX.

Report of the Committee.

If we rightly understand the object of the society in offering this premium, it is to collect and diffuse such information upon the management of pasture land, as will give increased attention to the subject of grazing land, and not, as some have thought, to the reclaiming of pasture land for the purpose of tillage. It is a fact obvious to all, that the pastures have been neglected in this county for the last thirty years, while increased attention has been given to our tillage land. Our pastures have been left to be managed by any boy that was large enough to let down the bars or shut the gate. It will be an object in this report to awaken inquiry upon the subject, rather than to give any particular method for improving our pastures.

What is the cause of the deterioration of our pastures? We think that many of our pastures have been injured by long-continued close feeding. Observation has taught us that twitch grass, that pest of tillage land, will die when closely fed for

two or three years; so with many of the grasses in our pastures, if they are not permitted to mature their seed, they die, and moss takes their place. If pastures are so situated that they can be permitted to mature their seed once in three or four years, and are then closely fed, they will produce much more than when they are fed all the season. It is not so much against close feeding that we so much object, as against continuing for a series of years, without giving the pasture any time to rest. We can point to pastures that have been injured, we think, by not being fed close enough at any time; the briers and bushes have outgrown the grasses.

"Change of pasture makes fat calves," is a maxim which contains much sound philosophy, and if its teachings were more heeded, we should have better pastures and cattle. In many of our pastures it is now literally a struggle for life or death between the cow and the grass, from spring to autumn, and often neither has vitality enough to exult in a victory.

But how shall we manage our pasture land? When a farm is so situated that it can all be conveniently ploughed and manured, it may be best to change from pasture to tillage. But upon most of our farms there are portions that cannot be profitably tilled. When such land is covered with moss, we recommend harrowing it in the spring, or warm days in winter, when the frost is out of the surface from one to two inches, and sowing grass seed. We prefer the harrow rather than the plough for land that is to remain in pasture, believing that nature put the soil right side up for grazing.

In the south-eastern part of the county, the pastures are injured by a weed that is not found to much extent in other parts. We refer to wood-waxen, a plant which will have the sole occupancy of the land wherever it gains a foothold. We know not what resemblance this plant may have to the bush which the Oriental shepherd saw burning in his pasture on Mount Horeb, but we know that this is often burned, but not destroyed.

Another method for improving dry, gravelly land for pasture, is by raising the locust tree. This, unlike most other trees, improves the quality of the grass, and increases the quantity. A strong illustration of the benefit of this tree upon pasture land may be seen upon the farm of John Nichols, in Danvers.

But what shall we do with our cold, rocky, bushy pastures? To improve them by ploughing will often cost more than they will sell for when reclaimed; yet the farmer may be so situated that it may be well for him to reclaim them. We think, however, that there is much land in this county, that is now known by the name of pasture, that might be more profitably used as woodland. Where the white pine and the birch grow up spontaneously, they will in a few years destroy the small bushes, and when the wood is fit to cut, we shall have a pasture which nature has renovated.

In the pastures to which the attention of the committee has been called, plaster has been used as a means for improving them. It becomes an interesting inquiry to know in what parts of the county, and on what kind of soils, plaster can be profitably used. Both of the pastures which we viewed were elevated, and moist, strong soil upon a retentive subsoil. We had the impression that plaster was best adapted to dry, poor soils; but from what we have seen and heard this season, we think that it is the best soils that are improved by it. In conversation, a short time since, with a gentleman from Bangor, he said that an accidental experiment, a few years ago, taught him that they had been acting upon a wrong impression in regard to it in that vicinity; that they received the most benefit from plaster on good land, well manured; that a greater proportional increase of crop was obtained when it was applied in addition to the manure than when applied alone.

If the society shall continue to offer this premium, we would recommend that it be under the direction of the Committee on Farms, so that we may have the benefit of the observation of the committee for a longer time.

Wm. R. Putnam, *Chairman.*

Joseph How's Statement.

It is with some hesitation that I offer my pasture lands for premium, as I have previously given my opinion, and partially my experience, which have been published in former reports. But as there has heretofore been no application for premium, and as last year there was no report from the committee, I

therefore concluded to offer my pasture for premium, that we might at least have a report on the subject. And believing, as I do, that good pasture land is as profitable as most other lands, at the price at which it is usually valued; that a large proportion is comparatively of but little income, and that much of it can be profitably improved, it therefore seems desirable that individuals should communicate their experience to others, and it may be expected that some benefits may be derived therefrom.

My pasture contains in all about seventy acres, and is subdivided into smaller pastures by stone wall. The soil may be termed a gravelly loam, with a mixture of stones, and on some of it the stones are so abundant that it cannot be conveniently ploughed. It is somewhat hilly; most of it is rather moist, although there are some dry knolls. Some of it was old bound out pasture forty years ago, and from other portions of it the wood has been taken off at different periods. Some of it was formerly ploughed and planted with corn, without manure, or with a very little compost in the hill, then sowed down to grain and hay seed, which partially improved the pasture for a short time. We occasionally used some plaster, but fearing that it might essentially injure the land, we used but little.

About twenty years ago, we commenced using it more freely, and for the last few years have used it on nearly all our pasture every year, or once in two years, at the rate of one and a half or two bushels to the acre. Some of our pasture land is benefited more than others, but all of it is improved more or less.

Some years ago I purchased about fourteen acres of land, one-half of which was covered with wood and bushes, the other half was an old bound out pasture, which had not been ploughed for twenty-five years. Previously to that time, it had been planted and sowed without manure, until it would hardly pay for cultivation. It had been rented for several years for three dollars per year, and the person that hired considered it a hard bargain. During the seven years I have sowed it with plaster four or five times, and it is now a good pasture. I think the feed is now worth as much on one acre as on the whole piece when I purchased it. But I think it is not what it would have

been had it never been ploughed, for land that has once been worn out by excessive tillage without manure, although it may lay uncultivated or pastured for a long series of years, will not be what it would have been had it never been ploughed. About four acres, which were covered with wood and bushes, have been cleared, the land sowed with plaster, and it is now a first rate pasture, far superior (as might be expected) to the old pasture described above. One cutting of the bushes was sufficient, as it usually is where plaster is used; not that the plaster in any way prevents the growth of the bushes, but a thick growth of grass springing up, the cattle, while feeding it, will also feed the tender sprouts, and soon eradicate the bushes. Bushes, however, that the cattle will not eat, such as sweet fern, hard-hack, ground hemlock, &c., will require occasional cutting, or pulling up by the roots. In the above case, the brush and bushes were not burned, but rotted on the land, which I think is much better than burning. The growth of bushes was whortleberry, hazel-nut, witch-hazel, &c.

On a dry part of the pasture, I spread on last year about three cart loads of mud to the acre, which has improved the pasture, and I think will pay the expense. The mud was taken from a pond-hole in the pasture, in August, 1852. It appears to be rotten vegetable matter, not unlike common meadow weed, but not peat.

On some of my other pastures I have used leached ashes, from 150 to 200 bushels to the acre, with good success.

The first of June I had in my pasture thirty-seven cows, four oxen, one yearling heifer and two horses. It was not long, however, before the butchers commenced taking away my beef cows, so that by the time of the severe drought, in August, the number of my cows was considerably reduced. Thus I had a tolerably good supply of feed through the dry season, and an abundance after the rains commenced. But I cannot state definitely the amount of stock that my pasture would keep through the season. It is desirable that there should be some surplus feed in pastures, as close feeding is injurious, and causes them to deteriorate or bind out.

The increase of the feed is not all the benefit resulting from improving pasture land, for as the quantity increases the quality

improves; and if an animal will get fat for the butcher at midsummer, instead of running the whole season, the keeping for one-half the season is saved, while the beef usually sells then at a higher price.

METHUEN, Nov. 15, 1853.

Jacob Farnum's Statement.

I present to your examination two pastures, one with fifteen acres and the other with twenty-three. May, 1851, I spread one ton of plaster on each pasture. In 1852, the expense of cutting and pulling up savins was about ten dollars. First of May I spread two tons on each pasture. Cost of plaster purchased at Haverhill, was $5.50 per ton; cost of drawing and spreading was $2.50 per ton. One pasture is very spongy; the other is dry. I feel encouraged to try more on my other pastures.

ANDOVER, Nov. 12, 1853.

ORCHARDS.

The interest in the cultivation of fruit has increased to such a degree that most of the societies offer premiums for orchards of various kinds, leaving the examination to be made in some cases by the committee on farms, and in others, appointing a special committee for this purpose.

MIDDLESEX.

Amos Hagar's Statement.

I submit the following statement in regard to the management of my orchards. The first orchard contains, by estimation, two and one-half acres, has a north-westerly slope. The soil is a deep loam, with a clayey subsoil mixed with blue gravel. This lot contains two hundred and thirty-four apple trees, set thirty-two feet square, with one in the centre. One hundred seventy-four trees were set out in the spring of 1844, twenty-five in the

spring of 1845, and thirty-five in the spring of 1851. The trees when set were, most of them, one year's growth from the bud. Every fall I have put on some ten loads of compost manure to the acre, and ploughed it in. I have kept it planted with corn, potatoes, and turnips (common shovelful of manure to the hill) with the exception of the summer of 1852.

The second orchard contains, by estimation, four acres, has a northerly, north-easterly, and north-westerly slope. Soil is similar to that in first orchard. This lot contains six hundred and twenty-eight trees, one-half apple, one-half peach, set thirty-two feet square, with one in the centre, or sixteen feet each way—apple and peach alternately. Four hundred and seventy-four trees were set in the spring of 1851, and one hundred and fifty-four in the spring of 1852. My manner of setting this lot was merely to dip the roots of the trees in soft manure, just before placing them in the earth. I have manured this the same as first lot, and kept it planted with corn, potatoes, and turnips.

Most of the apple trees were two years', and peach trees one year's growth from the bud when set. My principal variety of apples is the Baldwin. I have some one hundred trees of Hubbardstons, and a few trees of other varieties not now remembered. I have never washed my trees with any thing; trim them in May and June.

Lincoln, Sept. 24, 1853.

William B. Harris' Statement.

My orchard contains six acres, covered with trees of the Baldwin variety, with five or six exceptions. They are set two rods apart with peach trees between, in most places. In regard to setting peach trees between apple, I think it should in no case be done where the apple trees are less than two rods apart, for they will certainly infringe on the growth of the apple trees unless they are kept closely pruned. If apple trees are far enough apart to allow the peach sufficient room, peaches can easily be raised between them; as the peach tree is of short duration it would usually die before any harm could be done to the apple, if room is allowed. My plan, however,

is to set peach trees by themselves, not less than one rod apart, and apple trees should never be set within two rods of each other. My orchard contains two hundred and thirty-six trees, and set in their present place in the spring of 1844.

An important object was overlooked in rearing my orchard, until it was too late to correct the fault; this was in not shaping the heads of the trees, in a manner that would allow ploughing, &c., to be done among them with sufficient ease; all the fault I notice in the appearance of my orchard is in our not having known that by arranging the tops of trees, properly, it would favor the future growth, and also the bearing and ripening of the fruit. The most important fault is in not starting the lower branches sufficiently high to allow oxen or horses ample room to plough beneath; this fault should be corrected by all who contemplate to raise an orchard; every one should bear in mind that, "just as the twig is bent the tree's inclined." My folly should be a caution to others.

The soil upon which my trees are planted is of many varieties, from the rich loam to the almost unproductive knoll of rocks, and I can see a vast difference between the trees on productive land and those on that which is poor. I think apples can be raised on rocky land, that will keep longer and better than those raised on loamy soil, but the apples will in most cases be much smaller, as will also the trees, and apples thus raised are more liable to be of an irregular shape. I keep the trees under a continued state of cultivation, raising potatoes, corn, squashes, beans, cabbages, &c., with a large variety of root-crops; which are raised with profit, if not in too close conjunction with the trees. I make it a rule to prune annually in May or June, not forgetting that too many branches taken off at once will injure the tree; of the two months for pruning we prefer May.

I manure my crops liberally, and when dunging for crops I usually throw a quantity about the roots of the trees. The manure used is composed of muck and barn manure well mixed together; I intend to keep the land as free of weeds as possible; I have never washed the trees but once, but think young trees should be washed annually, with a composition of potash water and manure, which will give the trees a healthy appearance if it does not benefit them.

I think I shall gather at least twenty barrels of apples from the trees this present season, which will be as many as I could expect. In regard to the treatment of insects, I remove caterpillars as soon as discovered; have never been troubled with borers, and seldom with insects of any kind, except that the present season a large number of the "Palmer Worms" could be found on almost every tree; they seemed to come all at once and to disappear in the same way; they have not as yet injured the trees, but we think their presence another season will be more disastrous, as we anticipate them in larger numbers. I know of no prevention.

North Woburn, Sept. 27, 1853.

Luther Adams' Statement.

I send you a statement concerning my apple and peach orchard that you had the goodness to examine. My land is a sandy soil with a coarse, gravelly subsoil, full of stones, and sloping to the west; it was pasture land planted one year with potatoes, and one year with corn, and well manured. The trees were set in the spring of 1847, two years from the bud, and raised in my own nursery. The holes were dug two feet deep, and broad enough to receive the roots without bending them; the soil laid one side and the subsoil the other; soil thrown into the bottom and the trees set in the soil, making no use of the subsoil, with care not to have the trees stand too low. It contains ninety-seven apple trees and one hundred and six peach trees; the apple trees stand thirty feet each way, the peach in the centre of the square; the peach covering more ground than the apple trees. I have kept the land cultivated, spreading on about twelve cart-loads of green manure from the barn cellar every spring. I cultivate corn, beans, potatoes, squashes, and ruta-bagas. I trim my apple trees every spring, believing that it does not make much difference when you trim after the tree has done growing in the fall until it starts in the next spring. I do not like to wound a tree when it is growing, for I think I have seen its bad effects. I washed my trees in 1851 and in 1853, with potash water, one pound to a pailful of water.

Townsend, Sept. 12, 1853.

John B. Moore's Statement.

The orchard I offer for premium contains two hundred apple trees, seventy-two trees set in 1850, and one hundred and twenty-eight in 1851. The trees were all raised by myself, and were one and two years from the bud when set, and nearly all Baldwins.

The land was an old pasture, soil high, dry, and gravelly loam, broken up at the time the trees were set, and has been constantly cultivated with some hoed crop. Manure mostly spread and ploughed in, and none ever applied directly to the trees since setting.

The trees were set in holes two feet deep, two rods apart, and manured with two shovelfuls of weak compost, composed of manure, bone dust, ashes and peat. I have never seen any insects except caterpillars, and those we destroyed.

Usually wash my trees with a weak solution of oil soap, but these trees were never washed.

Trim in June, but small limbs at any time when convenient; begin always to get a well-balanced head and a stocky tree without ever tying to stakes.

Concord, September 1, 1853.

Benjamin Wellington's Statement.

The orchard to which I wish to call your attention, consists of one hundred and forty apple trees, one hundred and ten of which were set in the spring of 1846, the remainder in 1849. The soil in which they are set, is a deep yellow loam, situated upon the eastern slope of a hill. They are set out in rows, thirty-five feet apart each way, with peach trees between the rows in one direction. The holes were dug about three feet across, and eighteen inches in depth, then filled nearly level with the surface soil, particular care being taken at the time of setting, that the roots should not be covered more than their original depth, and I have several times since spread from the trees the extra soil which had accumulated about them by the plough. The land had been ploughed and planted with alternate crops of corn, potatoes, &c., with the exception of

about one-fourth, from which I took a crop of oats, and one of clover, thinking then, as many do now, that if a space was kept dug around the trees, that was sufficient; but I learned, by a very perceptible difference in the growth of the trees, that I was mistaken, and I am now satisfied that no orchard can be successfully grown without a thorough cultivation of the *whole* ground overspread. I have washed my trees every spring with a weak solution of potash, and have not been troubled at all with borers or other worms.

Ebenezer Richardson's Statement.

The orchard which I offer for your inspection, is on a lot of six acres; the soil is slate gravel. When I bought the farm, this lot was sown with rye, and the crop was not enough to pay the expense. I sowed it once afterwards, with the same result. I then turned it to pasture for fourteen years, during which time, I do not think it produced more than half enough to keep one cow. I came to the conclusion that it was good for nothing but pines, which began to grow thriftily, but not liking to have their shade on land north of them, I thought I would try an experiment with an orchard on it. I ploughed one-half of it deep, and sowed buckwheat; the crop was thirteen bushels. I then ploughed the whole lot as deep as I could, and sowed it with buckwheat, and to my astonishment, had the largest growth of straw that I ever saw; the seed was not equal to the straw, but a good crop. I then ploughed it as deep as I could conveniently. I had a lot of apple trees in the woods and pastures which came up from the seed scattered by the cattle, and the next spring, which was 1848, I took up these scrub trees and set them thirty feet apart each way, with a peach tree between one way.

Not finding quite enough, of the right size, of the scrubs, I examined a large tree with a lot of thrifty sprouts about it, and found they came from large roots, from four to six inches under the surface, and full of fibrous roots. I broke off sixty of them, cut the ends smooth and filled out the lot with them; they all lived and grew finely. In taking up and setting out, I spent the time of three men two days in 1849. I cut them off and grafted them about three inches under the surface; all

but about fifty of them which were not large enough. Put two scions in a stub. In 1850, I cut out one where there were two, and found roots on the scions fifteen inches long. We set out two or three of them that were cut off and they lived and grew finely. I have ploughed the lot deep, every year but one, since the trees were set out. Three years I manured with compost manure, three shovelfuls to a tree, the other two years, two quarts of ashes to a tree; never have washed them with any thing.

PEPPERELL, 1853.

H. H. Bigelow's Statement.

I send you a statement concerning my apple orchard, which contains one hundred and ninety-two trees, standing on four and one-quarter acres of land. The soil is a deep, dark loam, and was considerably rocky before the trees were set out. The land was dug up, and ploughed, the rocks removed, and the holes dug for the trees, in the fall of 1850, and the trees were set out the April following. The holes were dug about twenty inches deep, and from five to seven feet wide, and two rods apart; the best part of the soil being laid by itself, to put around the roots, after mixing with it about two bushels of compost manure to each tree. Care was taken that the trees were set at the same depth they were before being transplanted, and that the roots were spread and arranged in their natural positions. The land was, the same year, and the following, planted with corn, and hay was put around the trees to keep the ground moist; but I removed it in the fall, for fear of the mice, and put, instead, compost manure, to support the trees and keep the soil warm during winter,—spreading it upon the land in the spring. I have washed the trees with potash-water once—one pound of potash to a pailful of water. I think too frequent washing not good for the trees. I have trimmed the trees, thus far, in the months of May and June. I never was troubled much by borers, caterpillars, etc. The trees are mostly Baldwins, and were two years from the bud when set out.

MARLBORO', September 12, 1853.

James O. Freeman's Statement.

As I offer the same orchard for premium, this year that I did last year, and as there is no change in the committee, I have not deemed it important to give you many particulars, rather referring you to the 55th page of the last year's committees' reports.

I will merely say, that the orchard contains three hundred and six apple trees; sixty-four set in the spring of 1844; fifty in the spring of 1845; fifty-seven in the spring of 1847; sixty in the spring of 1848; seventy-five in the spring of 1852.

The soil in which my orchard is located, is a sandy loam, with more or less stone, about two feet or more below the surface.

This year, and last year, have manured my crops of corn and potatoes in the hill only (in the orchard).

Have before used about thirty or thirty-five cartloads to the acre, ploughing it in about four or five inches deep.

Have not been troubled with borers or other worms, but very little. Usually wash my trees with potash-water in June. Generally trim in May or June.

Framingham, September 28, 1853.

Asa Clement's Statement.

I send you a statement concerning the orchards you saw at my place. The land on which the pear trees are now growing, four acres, was, five years ago, an old bushy pasture, and covered, to some extent, with rocks, large and small, which were cleared off, and put into double walls around the piece. There are on it eighty rods of blind ditch, from three to four feet deep, a small culvert through the whole, and filled with stones to within about one foot of the surface. Many large stones were dug under and sunk, so that a plough will run over them without interruption. Some of the soil is wet and heavy, and other portions are dry and warm, comparatively, and contain some sand, while the wet portions contain a large amount of gravel, and a very small share of clay; the whole being so hard, that, after digging from eighteen to twenty-four inches deep, I was obliged to

use a pick. The land was, half of it, manured with wool-waste, at the rate of five cords to the acre, and planted with corn and potatoes, in 1850.

After harvesting, the stones were cleared off, another light dressing of manure applied, the ground ploughed, smoothed down, and laid out for the standard trees, and at the same time planted with nursery stock, and one hundred and eighty pear trees were planted in the autumn of 1850. The following year, the remaining half was treated in the same manner. I dug the holes for the trees about two feet deep, and from three to four feet in breadth, and used from one and a half to two and a half bushels of compost manure, for each tree, which had been prepared in the following manner: four cartfuls (thirty bushels each) of virgin soil from the woods, four of meadow mud, three of stable manure, one of wool-waste, two of clay, thirty bushels leached ashes, four bushels air-slacked lime, two of plaster, one ton iron, turned from castings, mainly, and very fine. All this was mixed together, and made a somewhat highly-seasoned minced pie.

My share of practical knowledge of pears being within narrow limits, I was obliged to resort to the books for instruction, and planted the different sorts in wet or drier portions of soil, as they were reputed to be adapted,—Bartletts in dry, and Van Mons Léon le Clerc in wet, etc.

The varieties, beginning on the south-west corner, are as follows, viz.: three Madeleine, four Bloodgood, five Julienne, six Dearborn's Seedling, four Golden Beurré of Bilboa, four Muscadine, seven Flemish Beauty, seven Belle Lucrative, four Urbaniste, five Lewis, six Oswego Beurré, eight Winter Nelis, nine Beurré d' Aremburg, ten Vicar of Winkfield, three Pound, or Winter Bell, eight Duchess d' Angouleme, ten Van Buren (of Edwards), nine Knight's Monarch, eight Lawrence, two Catillac, two Easter Bergamot, two Passe Colmar, three Glout Morceau, two Easter Beurré, forty Bartletts. South-easterly section, nine Beurré Diel, five Beurré Bose, six Andrews, seven Heathcot, eight Seckel, nine Buffum, ten Fulton, eleven Dix, eleven Onondaga, eleven Louise Bonne de Jersey, three Bonne Chretien Fondante, three Van Mons Léon le Clerc, three Napoleon, and one or two each of forty other varieties, for

testing. The reason why I have planted so many varieties, is, the cultivation of pears here, is looked upon as a visionary scheme, and by many, talked about discouragingly; and should some fail to do well, I hope to find others that can be worked upon, and prove satisfactory. The growth of the trees thus far, has been all I desire, with very few exceptions, which will occur among three hundred trees of any sort. Many of the above have fruited this season, and a greater number have set with fruit-buds for the next.

The apple orchard contains one hundred and seventy-five trees which are planted two rods apart, and zig-zag, so as to cover the ground more equally. The varieties are the following, viz.: ninety Baldwins, fourteen Ladies Sweet, twelve Hubbardston Nonesuch, eight R. I. Greening, eight Jewett's Fine Red, four Danvers Winter Sweet, four Early Sweet Bough, three Early Harvest, three Porter, two Russet Sweet, two Northern Spy, two Aunt Hannah, and one each of the following for the purpose of testing: Superb Sweet, Victorious Reinette, Canada Reinette, Cogswell, Dodge's Sweet, Lyscom, Minister, Swaar, Red Astrachan, Golden Ball, Yellow Bell Flower, Green Newtown Pippin, Fall Pippin, Maiden's Blush, and others, together with three or four seedlings with peculiar habits of growth, which I intend shall bear fruit before they are worked. About one-quarter of the number were set out six, and one-quarter five, and one-quarter four, and one-quarter three years ago, and the ground covered with nursery stock at the same time. The trees grew rapidly, and for the last three years I have been obliged to move much of the nursery stock, to prevent interference with the standards, which I find grow better the less they are obstructed by a proximity of other trees. The soil in this orchard is similar to that I before described, except that it nearly all lies higher, and that portion on which the peach trees are planted with the apple, is much more dry than the other, prepared in pretty much the same manner, except that the stones were not so thoroughly cleared off, and compost made of stable manure and meadow mud in equal parts was used instead of wool-waste. Dug holes as for pears, and used two bushels of the last named compost to each tree.

The peach trees, two hundred in number, were planted with

the apple, on the highest part of the last named orchard, and at the same time, one rod asunder and one rod from standard apple trees, which gives three of the former to one of the latter. About half as much compost used in planting as with the apple. Varieties: Coolidge Favorite, Grosse Mignonne, Early Crawford, Late Crawford, Southwick Seedling, Cutter's Rareripe, Chelmsford Mammoth, and Boot Peach; the four last local names, but good, nevertheless; and Osgood's Late Yellow, which last matures about the same time as Late Crawford. The growth and fruitfulness of these trees has been satisfactory.

As you had an ocular demonstration of their bearing qualities, and an opportunity to test the quality in the surest manner known by me, I will leave the subject and bide your judgment.

Dracut, Sept. 15, 1853.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Report of the Committee.

Your committee report that there were but two apple orchards offered for premium; one by Mr. Josiah Ayers, of Amherst, the other by Mr. Leonard Loomis, of Whately. Mr. Ayers' orchard contains one hundred and fifty uncommonly thrifty trees, ten years old, all raised from the seed, and budded with the best varieties of fruit, with his own hands. He is entitled to much credit for his good management. His orchard shows conclusively, what can be accomplished by a judicious course of treatment.

The orchard of Mr. Loomis contains over one hundred trees, all very thrifty in growth, but not as straight and well-balanced tops as those of Mr. Ayers. The committee are of the opinion that Mr. Loomis failed in two important points in starting his orchard; first, in not getting the *best* trees to set, and second, not selecting—in all his trees—the best varieties of fruit.

Paoli Lathrop, *Chairman.*

November, 30, 1853.

Statement of Josiah Ayres.

I have in my orchard one hundred and fifty trees, budded on seedling stock. They are ten years old from the seed, and most of them have produced fruit. I have several varieties; the principal are the Baldwin and Rock Greening; the others are the Green Newtown Pippin, Seek-no-further, Roxbury Russet, Boston Russet, Hubbardston Nonesuch, Belmont, Talman Sweeting, Golden Sweet, Ribston Pippin, Famouse, Crimson Pippin, and some choice seedling varieties.

Mode of cultivation from the seed to the present time:—

One year from the seed, they were taken up, the tap root cut off, and set in rows. When large enough, they were budded. They have been transplanted four years. They were set two rods distant from each other, in holes from four to six feet in diameter, from one to two feet deep—the same depth as in the nursery—with compost mixed with the subsoil. They have had compost put around them in the fall, and in the spring the earth has been dug around. One year the turf, one foot in width, and about six feet from the tree, was removed and compost worked in, with good results. The trees have been washed with weak lye, in the month of May. I have not seen a borer on my trees. I have avoided trimming, as much as possible, and keep the trees in proper shape. The land on which the trees stand is sandy loam, and hard, stony and moist subsoil.

Amherst, October, 1853.

Statement of Leonard Loomis.

Below I send you a statement of the time and manner of setting my orchard, which I offer for a premium. The orchard contains over one hundred trees, a part of which were set in 1844, others in 1847, and the remainder in 1849. The holes were six feet in diameter and about two feet deep, and filled with compost of swamp muck and barnyard manure. The trees were carefully set in the spring of the year, which I consider preferable to the fall setting. I have not lost a tree.

Whately, November, 1853.

HAMPSHIRE.

Report of the Committee.

The culture of fruit trees has always received the attention of the inhabitants of Massachusetts, as a matter of high importance in its relations to beauty and utility. While the soil was new, it contained all the elements necessary for their growth; so that a crop of apple trees was raised with as much certainty as a crop of wheat. But afterwards, when some of the elements were exhausted from the soil, the orchards planted failed in vigor of growth and in perfection of fruit. The trees were smaller and shorter-lived, and the fruit was inferior in size and number. Their enemies too, of the insect tribe,—if not from increase of number, at least from diminished power of resistance in their victims,—were more successful in their attacks. As cider became less in demand for the table and for the distillery, and the orchards became thinner and less productive from the axe or from natural decay,—while the population of the State increased,—the supply of fruit became less, while the demand for the table or for culinary purposes became greater.

What then shall be done to supply the increased and increasing demand? The answer is: Increase the number of growing trees; improve the modes of cultivation. As nature, in the diminished fertility of the soil does less, art, reinforcing nature, must do more. By studying the laws of vegetable life, by the application of appropriate manures, in short, by proper cultivation, fertility can be communicated to the soil, vigor to the growth of the tree, and improved flavor and increased size to the fruit.

It is the object of the committee, in making their report, to throw together a few brief remarks for the benefit solely of the young and inexperienced cultivator, in the shape of rules, without accompanying them with a statement of the principles on which the rules are founded. Those who seek for the foundations of these rules in the conclusions of science, can find them elsewhere.

1. Plant a Nursery. Let your nursery consist chiefly of

apple trees. But let it also contain pear trees, cherry trees, peach trees, plum trees, and grape vines. Let them all be seedlings, obtained from good seed; unless the quince and the grape form exceptions. Let the nursery be planted in a deep, rich soil, and be kept in a rapidly growing condition by the free use ot manure and the hoe. Let trees which you remove to the orchard or the garden, be replaced by other trees, in order to meet your future wants. Let the trees in the nursery be so far distant from each other as to leave full space for the roots and for the sun, and for the removal of the trees without injury to other trees. It may be best to purchase some trees at first, which may come into bearing sooner than those from your own nursery. But, for the most part, in the course of your life, depend upon your own nursery. First, because it is more economical; secondly, because it will make you acquainted with the laws of vegetable life and with the habitudes of trees, and thus better able to take care of them in their advanced stages; thirdly, it will serve to interest you in trees, by keeping them before you from their infancy up to maturity; fourthly, it may be a source of revenue.

2. Select the ground for your orchard or fruit garden, carefully. It is not every soil or every exposure, that is adapted to your purpose, though judicious cultivation may do much in removing the disability of a poor soil and unfavorable exp sure. What is the best soil and the best exposure your observation of the experiments of others in the vicinity, whether successful or not, can teach you. As a general rule, a deep loam is better than a stiff clay, or a loose sand. Which is the best exposure—a north or south, an east or west—will, in different localities, depend on the season, on the proximity of the sea or a marsh, of a mountain or a forest. As a general rule, when you have your choice, you had better try both sides of a hill, and one or the other will prove preferable. It has been found, on trial, that peach trees bear best, sometimes on the sunny side and sometimes on the shady side of a building, according to the season; it is safe therefore, to try both sides, and then you have a double chance for success. The fruit buds, swollen by the sun and then checked by the frost, on the south side, may be safe on the north side; or the fruits destroyed by severe

cold on the north side, may be safe on the south side. For your encouragement, however, it should be remembered that the best exposure and the best soil are not essential to success, provided you bestow the appropriate culture.

3. Prepare your ground carefully. Fruit trees delight in a deep soil, made mellow, in which the roots can move freely in search of pasture. The soil should be prepared as carefully by the plough for a crop of trees, as for a crop of wheat. If it is your purpose to plant an orchard of apple trees, plough your land deep, according to the nature of the soil. Apply manure generously. Raise a crop of corn or potatoes on green sward. The next season manure again, if necessary, and sow the ground with oats. Just after your oats are sowed, plant your trees in the soil thus rendered mellow and enriched by manure, in which the roots can move freely and find nourishment. The oats will protect the trees against the great heat of the sun, and the roots dying will afford them nourishment. The soil formed of turf is appropriate to the nourishment of the roots of the trees.

4. Plant your trees carefully. In taking them up, see to it, that the spade does its office by digging a circular trench around each tree, near the end of the roots, which radiate from the trunk or stem. Dig under the ends of the roots towards the trunk or body, without wounding them. Raise each successively, commencing at the extremity, and the whole gently without tearing them. Keep the roots moist until they are transferred to their new habitation. Dig the hole so large that the roots will not be cramped. If there is any difference between the surface soil and that at the bottom of the hole, let the two be kept separate. Lay the surface soil next to the roots and the soil taken from the bottom, on the surface. Some cultivators apply a stratum of well-rotted manure between the two kinds of soil; but not in contact with the roots. Apply water to the roots after the surface soil is placed on them. The time for doing this in our country and climate is generally best in the spring, just after the buds have begun to swell, rather than in the autumn, though some kinds of trees succeed well when planted in the latter season, if proper care be taken in transplanting them.

5. Tend your trees carefully. For the first few years it is advantageous to keep the ground in cultivation, at least occasionally. Trim judiciously, not severely, unless the grape is an exception to the rule. The small branches can be taken off at any time of the year. The large branches seem more readily to harden and to be kept from decay until grown over, when trimmed in the winter. A strong soap suds or a very weak solution of potash applied to the body of certain trees, like the apple and pear, is recommended for giving them a smooth bark. Keep cattle away, but let in pigs and poultry, when it can conveniently be done, as it may sometimes. Our limits will not allow us to point out the various modes of defending them from their insect enemies. We will venture to suggest a repetition of a series of experiments, tried by one of our number ten or fifteen years since, which appeared to be eminently efficacious in destroying insect life. Sulphur intimately mingled with quicklime or with saleratus, appeared to be efficacious in destroying the worm in the root of peach trees, and the grubs and worms in garden beds. Would not these mixtures, thrown in powder upon trees, be a preservative against insects like the curculio, and the caterpillar, and canker-worm? The experiment is worth trying. If this should not succeed, are there not certain mineral poisons which might be proved by experiment to be efficacious in protecting vegetable life from insects? As the enemies to fruit increase, let your vigilance increase.

The motives for the cultivation of fruit may be found in its relation to beauty, health, comfort, and profit. Fruit trees in leaf, in flower, and in fruit, are eminently beautiful. Some of them are shapely and graceful in their forms. Certain pear trees and cherry trees are almost as regular and symmetrical as the evergreens. Besides being ornamental, they, like other trees, protect the house from the intense heat of summer and the intense cold of winter, by their shade or by breaking the force of the winds. Fruit is wholesome. Bonaparte, on a certain occasion, cured his army of the dysentery by sending them into the vineyards to eat ripe grapes. Moreover, the cultivation of fruit can be made profitable, even when conducted on a great scale. Witness the peach orchards of New Jersey and the apple orchards of New York. Fruit trees make home

attractive, and long-remembered. They make it like Eden, of which it is said that out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food. Imitate your creator, on your own grounds, and some of the happiness of Eden shall be yours.

WILLIAM C. FOWLER, *Chairman.*

AMHERST, Mass.

Statement of David Rice.

An individual may often own, or come in possession of a farm, on which stands an old orchard, that has ceased from excessive age, neglect, and improper management, to produce fruit, except in sparing quantities, and of the poorest quality—unfit for eating, and hardly worth gathering. There may be no young orchard on the place, or it may not be old enough to produce fruit. The owner desires to be supplied with fruit, while his young orchard is maturing, and must either purchase fruit or recruit the old orchard. The principle of economy is consulted, and he finds that it will be economical to reclaim the old orchard. And if the trees are not too aged, if they have not lost too much of their vitality, and if they formerly bore good, fair, palatable fruit, the chances for success are altogether in his favor. The trouble and expense of reclaiming an old orchard is small; and if the owner succeeds, he is repaid more than ten times over for his labor and expenses. In addition to this, the general appearance (and appearances go a great ways) of his estate is improved and beautified.

About eight years ago, I came into possession of the place on which I now live. On it was standing an old orchard, that had almost ceased to bear, and was, as it then existed, almost worthless. A part of the trees were beyond any hope of cure, "*in articulo mortis*," as the doctors say, and fit only for firewood. The remainder, I considered to be in an improvable condition. There was also on the premises, a number of young grafted trees, not yet in a bearing condition. Under the then existing state of things, I was obliged to purchase nearly all my fruit, or go without any. The thought occurred that I might do something to improve the productiveness of my

old trees, both in quality and quantity, so as to be supplied with fruit, while my young trees were maturing, and getting old enough to bear well. Accordingly, in the fall of 1845, I set myself about the task. I selected twenty-five or thirty of the most promising trees, had them well and faithfully trimmed of all dead, dying, unpromising, and useless limbs; being particular to leave the most thriving and vigorous ones, that grew from the centre of the tree. With a hoe, I scraped off the old loose bark and moss from the trunk and limbs, and removed the grassy turf from around the body of the trees, for a distance of two or three feet. I then applied from one-half to a bushel (according to the size of tree) of unleached wood ashes around the trunk, from whence I had removed the turf, being careful not to have the ashes approach within four or five inches of the bark. Over the ashes, I replaced the turf, with the grassy side down. The following spring, I noticed that the trees put forth new shoots in abundance, and large, luxuriant leaves of a dark green color, and were well filled with blossoms. I gathered, the succeeding autumn, from them and from a few young trees, just beginning to bear, nearly two hundred bushels of apples. Fifty bushels of these were fit for the fruitery or for winter use, and the others were as good as second rate apples commonly are. I have since continued to apply the ashes, and my trees are yet in an excellent bearing condition for an old orchard. My young trees are now beginning to bear a few apples. Last fall I gathered two hundred and fifty bushels in all. Two-thirds of these were from my old trees, and chiefly from those treated as above described. About seventy-five bushels of these were excellent winter apples.

I would not recommend ploughing among apple trees, especially old trees, at any time, nor under any circumstances. They need all their roots to sustain life and vigor. The plough always breaks and bruises more or less of the roots, if run ever so shallow. Some endeavor to avoid this, by leaving a space untouched under and around the tree, for a distance of fifteen or twenty feet in diameter. But the evil is not avoided in this way. The smaller roots, which are the most important, are certain to be broken, and the trees will sustain an irrepa-

rable injury. The addition of some ferruginous substance to the ashes, if the soil is not well supplied with iron, would do well. A quantity of cinders from the blacksmith's shop, such as fly from the hot iron when beaten, (oxide of iron,) has been suggested by Professor Nash. The soil in which my orchard stands, is well supplied with iron, and for that reason I applied none. The application of compost manure, to be spread under the trees, as far as their roots extend, is also necessary on sandy, gravelly soils, that do not contain much organic matter or loam. A compost of equal parts of chip, barn, and hog-yard manures, will make one of the best applications of the kind. I would also recommend the grafting of those trees that send up new and vigorous limbs, and which do not already bear good varieties of fruit. I have grafted several, and they are in a flourishing condition, although the scions are not yet old enough to produce much.

LEVERETT, September 27, 1853.

Statement of J. E. & A. C. Marshall.

Our peach orchard consists of eighty-five trees, and contains thirty varieties. Nearly all of the trees bore fruit the present season. A part of the land is a rich, gravelly soil, and the remainder, loamy. It was ploughed and planted, two years in succession; then sowed with oats, and seeded, previous to 1847, when we commenced setting our trees. We have continued to add new varieties. When we set our trees, we put three or four shovelfuls of well rotted compost manure into each hole, and mixed well with the soil. We have not since used manure around the trees or upon the land; but we hoe, the first season, and keep the ground clean and free from grass, for a space of two and a half feet in diameter. We have put some lime and ashes mixed together, around the trees once or twice. We have lost no trees by the borers, nor have we been troubled with them at all. Our hens and chickens have had free access, which we think may have been a preventive. We have cultivated five hundred nursery trees between the standard trees, on a part of the land. The remainder has been mowed, and two crops of hay taken off annually. We estimate the entire

cost of setting and taking care of the trees at twenty-five dollars. We have raised fruit enough in past years to pay nearly that amount. The fruit raised the present season was not all measured, but we estimated it at sixty bushels, worth one dollar per bushel.

AMHERST, October 26, 1853.

HAMPDEN.

Report of the Committee.

The cultivation of fruit in this county is a subject of vital importance; one in which every individual has a direct interest. It is not the farmer who owns his hundreds of broad and rich acres that alone is interested; every one who owns even a building lot, has an abiding interest in the cultivation of fruit. His own necessities, his convenience, his love of rural scenery, his taste for the embellishment and improvement of his happy home, are all concentrated in the pursuit and accomplishment of this subject. Other equally cogent reasons are ready to sustain our views. But argument upon this point is unnecessary. The fact is demonstrated, and it is a matter of gratulation, that it is fully recognized by many in various sections of our county. The increasing attention bestowed upon the subject for a few years past, affords a cheering prospect for the future.*

But the ardent hope that the supply will soon equal the demand, is a precarious one, with all its cheering appearances. While the demand is still increasing far beyond the supply, how long will the citizens of this county permit this state of things to exist? How much longer will you continue to reward the enterprise of those living in other States, to the sacrifice of your enjoyment as well as property. This should not be so any longer. The time has come when every individual should not only think but act, and act with decision and energy. Every inducement is before you to engage in this enterprise. It is a

* From the most reliable sources we are informed that not less than five thousand dollars have been paid in Springfield for apples only, this fall; from one individual we learn that he has paid for cherries this season, $61.50; strawberries, $135.37; peaches, $309.08; melons, $80; pears, $2.50 per bushel, $100; chestnuts, $174; walnuts, $142; apples, $500. Another house has paid for strawberries, peaches and pears, $207.75, making a total of $1,710.62.

delightful employment, full of instruction to the mind, and rich in its rewards for the labor bestowed. The late lamented Downing said, and few were ever better qualified to say it than himself, that "*fine fruit is the most perfect union of the useful and beautiful, that the earth knows.*" Every one who loves his home or his country, is in duty bound to supply his own demands, and thus add his proportion of the useful and beautiful, both to his home and his country.

The directors have been called upon to examine the orchards of five applicants: three of apples and two of pears. An opportunity has been thus offered, for a more extended observation of the attention which the subject has already aroused in the minds of many who have too long deferred their action; we noticed, with great satisfaction, the recent transplanting of many orchards, which, from their healthy growth and general appearance of skilful management, gave every indication of a sure remuneration for the labor bestowed. In passing upon those more immediately under our cognizance, we mean no disparagement to any one when we mention more particularly the one of Mrs. Richard Bagg, Jr. Mr. Bagg was the pioneer in the enterprise of supplying the growing markets in this vicinity with garden vegetables; in this, his uncompromising energy and success went hand in hand; having systematized this branch of his business, his active mind embraced a wider range, and his products found a ready market in our large cities. The cultivation of fruit seemed to him an appropriate branch of his business. To think and act, were with him synonymous; with these views he purchased a tract of land, with no higher recommendation for such purpose, than the minimum price at which it was offered; it was here Mr. Bagg commenced, in the spring of 1851, his operations, by setting four hundred trees; the exact position in which they stand to each other from any position of view, is characteristic of the man in all his dealings; his labors here were short; scarcely had he arranged these materials for his *monument*, before he was summoned to have his name written—with the dead; his epitaph upon this monument should be written, *useful* and *beautiful.* The remaining orchards deserve the attention of all who are about commencing an orchard, and would avail themselves of

the judgment and experience of others; in awarding the premiums, the directors have not been governed solely by the rapid growth of wood and branch, but have considered the facilities for promoting the growth and the position of the trees.

DANIEL REYNOLDS, *Chairman.*

Mrs. R. Bagg's Statement.

This orchard is situated on the farm of the late Richard Bagg, Jr., in West Springfield, and consists of four hundred trees. They were set in the month of April, 1851, in rows two rods apart each way; when set, holes were dug about two feet square and two feet deep, and filled with rich meadow loam, in which the trees were placed. The land has been cultivated with hoed crops, and received a good dressing of manure and ashes every spring.

Ocran Dickinson's Statement.

The orchard which I offer for the examination of the directors, is in the immediate vicinity of my dwelling-house; the soil, a rich alluvial loam, admirably adapted to the cultivation of fruit; with this view, I transplanted, in the fall of 1848 and spring of 1849, what I considered a judicious selection from several nurseries, of the most approved varieties of apples and pears, as per catalogue annexed. The mode of cultivation which has thus far been pursued with them, has been, chiefly to promote a healthy action of the sap, and thereby to cause a rapid growth of wood; to produce these results I have usually, in the month of November, given them a full dressing of manure, fine and well prepared, as a top-dressing; and in the spring this is dug in and thoroughly mixed with the soil; in June they are washed, trunk and limbs, as high as practicable, with a solution of whale oil soap, prepared with one and a half pounds of the soap to a pailful of soft water. This preparation protects the tree from insects, and keeps the bark of the trees in a healthy state. During the summer the ground around them is kept clean from weeds and grass, by the use of the hoe. In pruning, I prefer the spring season, and the knife rather than the saw; amputation of limbs should be prevented by the

early application of the knife. The following varieties constitute the selection above referred to, viz.:—

Baldwin, twenty; Northern Spy, six; R. I. Greening, six; Golden Sweet, four; Roxbury Russet, four; Winter Pearmain, four; Pome Royal, three; Congress, three; Porter, three; Hubbardston Nonesuch, three; Newtown Pippin, three; Early Sweet Bough, two; Early Harvest, two; Orange Pippin, two; Fall Pippin, two; Summer Pearmain, two; Maiden Blush, two; Sour Bough, two; Yellow Gillyflower, two; Moore's Sweeting, two; Late Golden Sweet, four; Wine Apple, one; Pennock's Winter Red, one; Blue Pearmain, one. Total, eighty-four.

My collection of pear trees, contains the following varieties, viz.: Bartlett, six; Flemish Beauty, five; Duchess D'Angouleme, four; Virgalieu, three; Jargonnelle, three; Seckel, four; Louise Bon de Jersey, four; Beurré Diel, two; Bloodgood, one; Glout Morceau, one; Vicar of Winkfield, one; Passe Colmar, one. Total, thirty-five.

In the cultivation of the pear, I pursue the same method as with the apple, with this important exception, a mixture of iron filings should be incorporated with the manure used in the pear orchard. I would caution all against the use of long or straw manure around their trees in the fall, or in any manner providing material for the winter quarters of mice.

West Springfield.

Sardis Gillett's Statement.

The apple orchard which I offer for premium, consists of one hundred and one trees, viz.: fifty Baldwins, twenty-one Rhode Island Greenings, fourteen Roxbury Russets, seven Newtown Pippins, seven Fall Boughs, and the remainder assorted kinds, which were set out in the spring of 1849. The land is on the top of a hill, the highest land on my farm, and consists of a red gravel; the land was new, and had a crop of rye on it the year previous to the planting of the orchard; it has been cultivated with corn and potatoes every year except the past. I have cleared up my wood-yard every fall, and put the chip manure around the trees, which is all the manure it has had except in

the spring of 1851, when I planted it with potatoes; I then spread a little fine compost around the trees.

SOUTHWICK.

D. Chauncey Brewer's Statement.

At your request, I have sent you the number of pear trees which I wish to enter for premium. It is twenty-six; one-half are standards, the remainder, dwarfs. They are of the following varieties: Bartlett, Beurré d'Amalis, Beurré Diel, Beurré d'Aremburg, Louise Bon de Jersey, Flemish Beauty, White Doyenne, Frederick of Wurtemburg, Henry IV. and Madeleine.

The soil on which they stand, is a sandy loam; it has been cultivated for three years, and was in a good state for transplanting. Part of them were set in the spring of 1852, the remainder in the fall. The standards are set twenty feet apart; between these are set the dwarfs, which brings them ten feet from each other. Many persons would suppose this too near. But the pear requires less space than other trees. Many individuals set them only eight feet apart; but I think this too close. I keep my trees well headed in, and give them plenty of mulching; some of them have made three feet growth this season. Success depends, in a great measure, upon judicious pruning, and proper mulching. I have recently picked from one tree, two Flemish Beauty pears, that weighed three-quarters of a pound each; the same tree has had quite a number taken from it that would weigh nearly the same.

SPRINGFIELD.

FRANKLIN.

Report of the Committee.

There were entered, for premium, six young apple orchards.

The committee visited them in September, 1852, and in September, 1853.

The season has been an unfavorable one for apple trees. The drought has been severe, and the worms stripped the trees of leaves in June, and materially retarded their growth. Some of the orchards visited have done very well, and have

amply repaid all the care and labor which have been expended upon them. The committee are rejoiced at the increased interest which has been awakened, within a few years, among our farmers in their orchards. Young and thrifty trees are appearing on every side, and the old native cider apples are giving place to choice eatable and marketable fruit. The people of Franklin County are just becoming conscious of what they can do in raising good fruit. We have been and are still behind most other counties of the State, but the increased facilities for reaching market have turned the attention of many in this direction. It is to be hoped that the good work will be carried on, and that many of our hill sides will, ere long, be covered with fruitful orchards. We think that our farmers have no occasion to fear that the market for good winter apples will be overstocked. The demand is yearly increasing, and we, in Franklin County, are not able, and shall not be for years, to supply the wants of our own neighborhood. Fruit is becoming a more important article of food, and is destined to occupy a far higher place than it now holds, in the supply of the table. The time is not far distant when, in every "well regulated family," a bed of strawberries and raspberries will be thought as indispensable as a bed of beets and cabbages now is, and when a dozen barrels of winter apples will be regarded as only a moderate supply for a family. The day for dried apples has passed. We want, and we can have, fair, fresh apples till June, when strawberries come to take their place.

There are few departments of agriculture which are better calculated to awaken a generous enthusiasm, and a sincere love and respect for the occupation, than the cultivation of fruit trees. It taxes the best powers of a man's mind; it brings him into near and pleasant contact with many of the most beautiful operations of nature. A thrifty orchard which a man has set with his own hands, whose growth he has watched for years, which he has defended summer and winter, will be to him a source of exquisite pleasure; it will bind him more closely to the spot which he calls by the sacred name of home. The moral influences which attend the cultivation of fruit trees, and the free use of fruit as an article of food, we conceive to

be both great and good. As a source of pecuniary profit, we are persuaded that the labor of the farmer in this county cannot be turned to better account than by the cultivation of fruit; only he must be content "to labor and to wait." Something more will be required than to set out his trees; they need cultivation as much as the field of corn. Every month of the year they need something to be done, and which cannot be neglected. Labor and care are the conditions of success here as well as every where else.

We do not propose to write an essay upon the raising of fruit trees, but a few thoughts have been suggested by our visits to the orchards of the county, which we beg leave to offer. We think more pains should have been taken than has usually been the case, in the selection of the young trees from the nursery. A tree can be forced into proper shape after it is transplanted into the orchard; but it is far better that it should grow into proper shape in the nursery. It is the business of the tree raiser to furnish you with a straight, healthy, well-balanced, well-rooted tree, a model, on a small scale, of what you want in a full grown tree. If he has not done this, he has not done his work well. Why should you patronize him more than any other bungler, and oblige yourself to do his work over for him? There are trees to be had whose branches are neither too many nor too few; they are the right height from the ground, and are regularly distributed about the trunk. Such trees are the most profitable to set out. Too much pains cannot be taken to have a straight trunk and a well-balanced top. The former can be obtained either by tying it to a stake driven into the ground, or by a stake lashed to the body of the tree. The latter can be secured by judicious pruning, or, in some cases, by cutting off the ends of the growing shoots on the heaviest side, and thus throwing the growth on to the weaker side. A tree which divides into two branches near the ground, can be made a useful tree only by cutting off one branch, even if it takes half of the tree; the other half is better than the whole would be. If the tree is not well shaped, the fault is in the orchardist; he has no one to blame but his own want of care or skill.

We have noticed, with regret, that some of the gentlemen

who have presented their orchards for inspection, have allowed their ground to remain in grass. If young orchards are of trifling or secondary consideration, this will do; but if one would have a good orchard, one worthy to be commended, it is indispensable that the ground be kept loose by cultivation. A crop of corn or potatoes may be taken advantageously from the orchard if care is taken in ploughing not to break the roots of the trees, and in hoeing to keep the ground round the trees clear of weeds and grass.

Mulching young trees is not sufficiently attended to. It is the only way in which young trees, or trees recently transplanted, can be preserved from a drought. Watering the surface does not do it. If the trees are well mulched they do not need watering.

We would urge all who can, to set out and cultivate fruit trees. Have an orchard, if circumstances will admit; if not, use up the odd corners of the garden, or the side hill, which is now suffered to run to waste. Do it for the sake of adorning your home and making it attractive and beautiful. Do it as a source of profit, and as a means of providing for your family wholesome and agreeable food.

Mr. Stebbins' orchard is not very large. He has no more trees than he can well take care of. His trees have grown well this year. We commend to the society the means which he has taken to free his trees of the worms, whose ravages have been so destructive to the fruit this year. We have heard of others who have used the same means with success. His orchard is well sheltered from the wind, and is upon land, which, owing to its position, would not be worth a fourth part as much as the land upon which all the other orchards to which a premium has been awarded, is worth.

Mr. Loomis' orchard gave the committee much satisfaction. He has a fine lot of trees. One row, in particular, which was set by the side of a tight board fence, and where a row of maple trees once stood, have grown with unusual rapidity. Query. Was it the decaying leaves of the maple which furnished the right nutriment to those trees?

Mr. Clapp had taken great pains with his trees. The bark

was clean and healthy, the trunks were straight, the tops well proportioned. Had his ground been ploughed and cultivated, we should have probably awarded him the first premium.

JOHN F. MOORS, *Chairman.*

HOUSATONIC.

From the Report of the Committee.

Of the capability of Berkshire to produce fruits of almost every kind, and in great perfection, we have for years been satisfied. We often hear the remark, "we cannot raise peaches in this climate, it is too cold;" and yet we have seen, during the present autumn, full evidence of the folly of this idea, in almost every town in the county. From Adams to Sheffield, the trees are loaded with the choicest varieties. The late, hard kinds, which nothing but a snow-storm could soften, and which, we were once assured by an owner, were raised expressly for the wool, seem to have disappeared, and it is found that the Melocoton, Crawford's Early and Late, Morris Whites, Stockton's Seedling, and other choice varieties, can be raised in the greatest perfection.

The pear is also fast becoming a standard fruit. The doctrine, that the tree must be left to a slow and stinted growth, to insure its life, is exploded. The superb pears, so large and fine as almost to deny their parentage and name, are produced by high culture, deep digging, and heavy manuring. This, we were assured by more than one very successful culturist at the heart of our Commonwealth, only the last week, was the secret of success; and by it, some foreign varieties which are in high repute at home, but had been called almost worthless in this country, have recently been brought out in all their ancient glory.

NORFOLK.

Report of the Committee.

According to the old Hebrew story, man was placed in a garden to till and to keep it, and man will never be contented and happy till he gets back into a garden again. The tales of the gardens of Alcinöus and the Hesperides, prove to us that, even in ancient times, men connected the golden age with golden apples, and put Paradise always in gardens. And, with the coming of the future Paradise, and the bright millennium of human hopes and aspirations, there is always associated the thought of the whole earth as one great garden of beauty and "delight," (the translation of the word "Eden,") abounding everywhere with luscious fruitage, and wreathed with sweetest flowers. This hope is the ultimatum of all outward culture — the crowning point of all outward earthly bliss. Even the ancient prophet places his joyfully-anticipated millennium in a garden, when he predicts that "the wilderness and solitary plain shall be glad, (or fruitful,) and the desert shall rejoice and blossom as the rose."

In the progress of that civilization which is to beautify, perfect, and bless the earth, first comes the wilderness, with hunting and fishing, and an immethodical, careless, half-savage cultivation of the soil; next, the farm, with its careful system and abundant products; and lastly, and *finally*, the garden, with its various and delicious fruits, — fit food for the immortals. And, if the civilization of our own land and the world at large is to be judged by its gardens, or even by its systematic and well-tilled farms, we can hardly yet be regarded as having emerged from the original wilderness.

Every friend of culture cannot but earnestly feel that the end and aim of all outward civilization, is to bring back to man the ancient Paradise; and a desire to feed again on the fruits that nourished his joyful days of primeval happiness, gives him no peace, till, lo! again the vines and the orchards gladden the hill-sides, and the trees, bending down with their golden perfumed bounty, win him back to the bliss of Eden, that seemed once to have forsaken the world forever!

The table of refined civilization is not a table of the hunting-ground, the wilderness, or even of the farm only — but of the garden. Think, for a moment, of the ancient Adam — the primitive man of Chaldee story — his hands dripping with gore, slaying and dressing a fattened ox, or an overgrown swine, while the lovely Eve, with smirched and greasy fingers, is peppering the roasting spare-rib on the Paradisial hearth. How much more delicate, refined, and beautiful! — how much more inviting and seductive! — a table covered with melting and delicious strawberries, with gushing raspberries, sending forth their delicate aroma, and fair bunches of the ruby cherry; or crowned with delicious, downy peaches, luscious, golden pears, or glowing apples, with their shining, waxen surface, and transparent clusters of rich, luxurious grapes, with their "purple light," not to speak of the various spring melons, and countless lesser fruits!

I am aware that, in a report of a society, distinguished by having Marshall P. Wilder for its president, and including among its members, men like B. V. French, Samuel Walker, E. M. Richards, Samuel Downer, Jr., etc., all hardly less accomplished and famous in the annals of American fruit culture, it may seem superfluous, as well as presumptive, to urge any reasons for the more extensive cultivation of fruit in our county. And yet, no true friend of culture and his race can ever rest content, while the blessings that result from such culture are restricted to the refined or wealthy few among us; or be willing to cease his efforts in the divine and glorious cause, till, from a costly luxury, fruit comes to be a cheap and universal comfort — one of the very necessities of life. Aye! he would labor by word and by deed, — by the dissemination of sound information, and through the influence of example, till the poor man's table shall be loaded with these luscious productions, and the child of the humblest citizen shall be blessed by their abundance.

The arguments in favor of universal fruit culture are so various, as well as so powerful, that we can allude to only a few of them here. And we fear, that, with all efforts, — so rapid is the increase of the non-producing consumer over the producer, — that it will be long, very long, ere the market price

of fruits will be such as not most fully to remunerate the wise cultivator.

And first. People of all ages and conditions of life enjoy the delightful refreshment that the juices of fruits bestow, even those who, not being cultivators themselves, vainly pretend to care little for such things. Such men will eat their neighbors' fruits fast enough, and, when they enter your house or grounds, do not heed their professions or their pretence of a distaste for fruits. Do not imagine that you will save your reputation, and pears and apples too, by offering to them such dainties.

Second. The fondness for the various unwholesome imitations of fruits, such as cakes, custards, pastries, and confectionery, not only indicates a love for the real article, but the displacement of these vile and noxious compounds would doubtless have a most beneficial effect upon the health of our people; for there is no diet so salutary, so refreshing, and delightful, both to the young and the old, as ripe fresh fruits. Indeed, there are not a few diseases, for which fruits are the best remedy. Those whose breakfast, or first food in the morning, is of fresh fruits, seldom or never suffer from dyspepsia, constipation, inflammation, or bilious complaints of any kind. The acid of fruits is a panacea for scurvy and eruptive disorders. Ripe peaches are found to be a specific in summer complaints; and the juices of all fruits tend to drive humors to the surface, and to purify the blood; and whole families, with scrofulous tendencies, have been saved and restored to blooming and elastic health, by returning back to the simple fruit diet of nature. In these respects, fruit is the antipodes of the mineral potash poison that, in the form of saleratus and soda, is destroying the teeth, stomach, and tissues of those of our countrymen who use such an uncivilized diet. The principal element of the bile is a sodaic alkali, and the natural acids of fruits stimulate the secretions of the gastric juice, and, by uniting with the alkaline secretions of the liver, purge the stomach and bowels of any excess of bile, cleanse and purify the whole system, and render all its secretions and motions natural and healthful. Carry the puny children of our towns and cities, who have been brought up on a miserable regimen, principally of meats, cakes, and teas, into the free, open country, to feed on berries and fruits,

and they soon pick up and grow plump, rosy, and hearty. O! how the meagre, wizened, pale-faced little ones of the street leap with joy at the sight of the glowing peaches and shining apples, bottling up, in their beautiful perfumed skins, more potent medicines than any apothecary's shop can boast, as curative as they are grateful.

Third. Doubtless dram-drinking and intemperance itself would be infinitely lessened, if not utterly banished from our soil, by an abundance of fruits; for the love of wines, cordials, ardent spirits, and liquors, is but a corruption of the true and natural taste for the juices of fruits; and it has been often noticed, that those addicted to the excessive use of such drinks are extremely fond of fruits by nature; and only give such an abundance of fresh wholesome fruit, and they will soon banish their wines and liquors, and various poisonous spirituous mixtures.

Fourth. Again, the philosophy of specifics, which is but just in its infancy, even in its application to the vegetable world, will, ere long, be seen to be equally applicable to the animal organization; and it will be found that, while potatoes, cabbage, &c., tend to muscular development, as instanced in the Irish and in the Dutch, the hull of corn and grain contributes to the bones, and their flour to the substance of the brain—fruits feed the nervous tissues and the spiritual body, and produce a mental elevation and harmony, and an exhilaration of spirits, that give a perpetual serenity, peace, and joy.

Such are some among the many reasons, besides the continually increasing pecuniary compensation to the intelligent cultivator, why we would urge the universal culture of the various garden fruits in their succession, till our fruit rooms shall be as common as cellar or pantry; our drawers of grapes and pears for winter use, shall be more universal even than our good stores of apples now; and the time come when the poorest and humblest man, from his little plat of ground, may nourish and delight his little ones, the year round, with the luxury of successive fruits, grown to be a necessary comfort.

And to this end it might be well for agricultural and horticultural associations, not only to distribute in their counties and towns the best seeds, the finest and most profitable scions,

plants and trees, grown to that end; but—what is of equal, if not greater importance—to disseminate, by publications and by lectures before lyceums and agricultural clubs, a knowledge of the correct principles of fruit culture—a subject concerning which, we can only drop a few hints, in conclusion.

In the first place, it must be borne in mind that, as in all culture, so most especially in fruit culture, is deep tillage the *sine qua non;* that trenching, subsoiling, and double spading are absolutely essential to enable the roots to run down into a mellow, rich soil, and thus produce an abundance of fair, large, and luscious fruitage. A neighbor of ours feared that he should lose a favorite pear tree, because one of his workmen dug a great trench by its side, in which to bury his cabbages for the winter. In place of receiving any injury, however, the tree was stimulated to a new growth, and a most prolific production of fruit of uncommon size and flavor, and the next year, of course, saw our friend trenching for pears himself. In setting out an apple orchard, or a few pear trees, there are many who will but just hoe a hole in the ground large enough to bury a cat in, pop the roots into it, and, as the trees dry up and die, have the impudence to say, "O! we never had any luck with trees." We always give thanks when any of our friends, who have the folly and the cruelty to deal thus with their trees, lose them, for they ought to die, and it is only a just retribution.

Secondly. The proper enriching of the soil, thus deeply tilled, is of hard.y less importance. A tree can no more grow without its appropriate food than a man can; and it is the salts of earths and manures, dissolved in water, that feed the roots of trees. There are those who plant out their trees in impoverished soil, or mere sand or gravel, without giving them a jot of other nourishment, as though they could live and grow without any rich, good soil, any more than oats or wheat can. No man of common sense, one would think, could expect to grow good, fine, juicy apples out of mere gravel-stones. There are others, who set out orchards in a green sward, and this, we think, is the most common of all blunders in orcharding. They thus allow the sod to grow tight up about their very stems,—they never come to have trunks,—and then complain "that the soil in their part of the country is n't at all suited to fruit

trees." Why? What would they think of a man who should plant a corn-field in the grass? How much of the sun, and air, and rain; how much nutriment from the earth, that is acted on and fertilized by the sun, and air, and rain, would the roots of the corn or the trees get?

Thirdly. The trees must not only be fed, but every tree must have its appropriate nourishment. Here the law of specifics, which is just beginning to receive the attention of scientific cultivators, comes in play. Thus it is found that one kind of nourishment conduces to the growth of foliage and wood, another tends to fruit; and, while one peculiar plant or tree requires one peculiar element for its sustenance, another demands a far different element. For example: lime is a great absorbent of acids, and thus materially assists in the elaboration of the juices of fruits; this is particularly observable in the apple tree, the bark of which is half made up of the lime, which it has thus thrown out of its circulation as useless, after it has employed it in its vegetable economy. To all trees, doubtless, a vegetable substratum of soil is necessary, composed of decayed wood, leaves,—like pond mud, peat earth, heath moulds,—but with this alone, without ammonia, or the sulphates and phosphates, or lime, to absorb and retain these, the fruit may be large and perhaps fine, but it will often be rough, coarse, and astringent on the one hand, or flat and tasteless on the other. A pear or apple, in cold clay soil, for example, is found to be a very different thing from what it is in a warm, loam, or sandy land. And, although the science of specifics is now in its infancy, and it may be difficult for some accomplished cultivators even to decide in regard to the best soil and culture for various and different plants and trees, yet it will, we think, be safe to say—1st. That wood ashes, containing, as they do, all the elements necessary to their growth, save carbon, that is supplied by the air, is a specific for all trees and woods. 2d. That lime, whether in the form of marl, shell, plaster, or stone lime, is a specific for apple trees; and that apples are fairest and largest grown in a calcareous soil. 3d. That phosphates, in the form of bones, (which are principally made up of phosphate of lime,) mineral, or rock phosphate of lime, or prepared superphosphate, are specifics for pears and grapes. 4th. That

ammoniacal manures, as guano, horse dung, and urine, are specifics for the peach, and give flavor and spirit to all other fruits.

Care should be taken to avoid the common fault of setting trees too deep, so that, to live and flourish, they are compelled to form new roots above the old.

Proper pruning is another important consideration in this connection. All trees should be shaped when they are young, so as to avoid the injury and unsightliness of mutilating large limbs when they are grown. Dwarfs, like hedges, should be pruned pyramidically, so that the lower limbs may not die out, and the sun, air, and rain may have access equally to the under as the upper branches. Peach trees, especially, need to have a large part of the spring growth cut in June, and a second pruning in August; this double pruning will throw the sap into fruit buds, make the tree stout and strong, and able, even when loaded to resist the winds; and, in place of a few etiolated and drawn out branches, will cause a thick growth, that will carry the fruit buds back near to the trunk; and the short, well ripened wood will withstand the winter frosts better, as well as the summer tempests. In this way, and by keeping a little heap of coal ashes round the butt, to keep out the borers, a crop of fruit will be always sure. Grapes and peaches, to produce fruit instead of leaves and wood, need constant and thorough pruning.

A mere allusion to the subject of mulching will conclude these hints. Though a matter that has received too little general consideration, yet, years ago, attention was called by the writer and others, in horticultural and agricultural periodicals, to the importance of mulching trees, shrubs, plants, &c. In other words, of covering the surface of the soil, around their roots, with light porous substances, as hay, leaves, straw, chips, shavings, sawdust, and even shells. The vast benefit of this operation will instantly be seen, when we reflect that the food of plants is always liquid; that their nutriment is sucked up by the mouths of the little spongioles at the end of the radicles or little roots, in the form of water that has absorbed the nutritious elements of the soil; and that when—as is apt to be the case in our periodical New England droughts—the ground becomes parched, the trees not merely become dry, but

are absolutely starved; and thus mulching, by preventing the evaporation of the moisture in which the food of plants is held in solution, keeps them always well fed, prevents the fruit from being checked in its growth, and so becoming stinted and knurly in its appearance, or falling prematurely; and, by affording a constant flow of sap, gives the rejoicing cultivator an abundance of fair, large, and juicy fruit from stalk, and herb, and vine tree.

JAMES RICHARDSON, JR., *Chairman.*

BARNSTABLE.

In former years, every farmer had his orchard, and apples were abundant. Of late, the crop of apples has been uncertain. The canker-worm has ruined hundreds of orchards, and in many "that which the canker-worm hath left, hath the palmer-worm eaten." The pear was seldom cultivated. Our fathers thought that it required a growth of fifty years for a tree to come into bearing; that the grandfather must plant, and the grandchild partake of the fruit; now, the pear produces in two years after the young tree is grafted, and is the easiest of all fruits to cultivate. By the skill and science of modern horticulturists, new and delicious varieties have been produced, and every man who owns a rood of ground, may have pears at all seasons of the year.

Soil.—The best soil for the pear is a strong loam, on a dry subsoil; it will, however, adapt itself to as great a variety of soils as any fruit tree. Wet soils are unfit, and sandy should be improved by a top-dressing of clay or heavy muck.

Exposure.—A south-west exposure is the worst in this climate. The strong, dry, south-west winds which prevail in the early part of the season, blast the tender leaves of the pear. They wither and turn black, and the tender shoots on the windward side shrivel and blast. Every old pear tree in the county leans towards the north-east, showing that a south-west exposure has always been more injurious than an easterly.

The pear, when engrafted on the quince, becomes dwarf in its habits, bears early, but is not long-lived. Dwarf trees may

be set within eight feet of each other. For standard trees, thirty feet is the distance usually recommended.

There are other kinds equally as good as the following selection; but we recommend these because they have been set by many in this county, and with few exceptions, have proved to be hardy and productive.

Dearborn's Seedling, early, native fruit; Bartlett, September, foreign fruit; Cushing, September, native fruit; Buffum, September, native fruit; Louise Bonne de Jersey, September, foreign fruit; Seckel, October, native fruit; Lewis, November to December, native fruit; Vicar of Winkfield, November to December, foreign fruit; Glout Morceau, November to December, foreign fruit; Prince's St. Germain, November to March, native fruit.

No entry was made for the society's premiums on fruit and forest trees. On the day of the annual cattle show and fair, the Rev. Mr. Pratt, of Brewster, handed the committee a description of the garden of Mr. Sidney Underwood, of Harwich. Since, the committee have received specimens of fruit from Mr. Underwood, and have examined his grounds.

Mr. Underwood's garden contains one acre. Nine years ago this land had for many years remained an uncultivated waste. Its fertility had been exhausted by repeated crops of corn and rye, and it was thrown out to commons as worthless. Mr. Underwood bought it for a trifle, put up buildings thereon, and commenced manuring and cultivating it. He set a variety of choice fruit, shade trees, vines, and shrubbery. Many of his trees are now in full bearing. Last year, after supplying the wants of his family and boarders in his house, he sold seventy-five dollars worth of fruit and vegetables from this acre of poor land.

Mr. Underwood is a mechanic, and most of the labor in his garden has been done as a recreation—at the intervals of business, in those odd moments which too many are inclined to spend in idleness at the shops and other resorts for loungers. He does his work scientifically; understands the art of grafting and budding; of pruning and heading in trees to prevent too much growth of wood and to increase the size and flavor of the fruit. He has about sixty orange quince trees, most of

them in full bearing, and fifteen peach trees which were loaded the present year with fruit of superior varieties, suited to this climate. He has plum, pear, and cherry trees, in bearing, and currents, gooseberries, and strawberries in abundance. The Isabella grape in his garden, ripens well; the clusters are large and free from blight. He has a small nursery of peach, cherry, pear, and quince trees.

The committee take pleasure in furnishing these details—that show what a man may do if he have the taste and inclination—show that there is no man who can say that he never had time to set a tree by his house or the road side. Trees and shrubbery increase the comfort, convenience, and income of those who plant them; they make a village pleasant, and add to the permanent wealth of the community. He that builds a ship, adds nothing to the substantial wealth of society; she may be lost on her first voyage, or in a few years use and decay will make her worthless; but he that improves the soil, creates wealth that will endure for generations.

Amos Otis, *Chairman.*

FOREST TREES.

By a law of the Commonwealth, it is made a condition of receiving the State bounty, that the societies "shall offer, annually, such premiums and encouragement for the raising and preserving of oaks and other forest trees, as to them shall seem proper and best adapted to perpetuate within the State, an adequate supply of ship timber."

Most of the societies have complied with this law, as in duty bound, yet but few applications for premiums have ever been made. The attention of farmers in some sections of the State, has, however, been turned to the subject, and it has been found profitable to plant many of the light and worn out lands of Barnstable, Bristol, and Plymouth, to the pitch pine. The following are the only reports made on this subject.

ESSEX.

Report of the Committee.

The committee appointed in 1848, upon the offer made by Richard S. Fay, Esq., of Lynn, for the cultivation of oaks from the acorn, have attended to the duty assigned them, and report:—

That on the 25th of September, 1847, a letter was received from Mr. Fay, through B. T. Reed, Esq., "proposing a prize of one hundred dollars for the best plantation of oaks, of not less than one acre. The prevailing species to consist of the white and the black, or the yellow oaks, to be grown from the acorn, planted this autumn or in the spring, on land not now under tillage, or in mowing. The prize to be awarded in 1852, and the money, in the meantime, to be placed at interest for the benefit of the successful competitor." In connection with this offer, Mr. Fay remarks: "It will require no great expenditure of time, and no money, to enable any person to plant an acre, and the advantage to the person so doing, would far exceed the labor bestowed, even if an unsuccessful competitor." He declines giving any specific instructions as to the planting, thinking "it will be best for every one to follow out their own ideas upon the subject."

Such was the offer, and such were the conditions on which the money was entrusted to the trustees of this society, and deposited with the treasurer.

On the 23d of June, 1848, notice was given to the secretary, by Dr. Andrew Nichols, of Danvers, that he had a plantation of oaks, situate "on the north-western brow of Nichols' Hill, in Middleton, made about the middle of May, from acorns gathered the last autumn, which had come up well, and the plants were then from one to six inches in height.

This plantation was entered by him for the premium offered by Mr. Fay.

Another entry was made by Mr. Wetherbee, for a plantation made about the same time, on the farm of Mr. Fay, in Lynn.

The committee visited both of these plantations, in the

autumn following, and found them in vigorous and healthy condition; plants sufficiently numerous, varying from three to twelve inches in height.

On the 8th of August, 1850, the following observations were made by the committee, upon Dr. Nichols' plantation. "Field rude, rough, and briery. Plants varying from one to four feet in height. The English oaks are much ahead of the American, averaging twice the height. The trees stand in hills about five feet apart, numbering about three thousand on the lot. Early in the season, the earth was stirred about the trees, and vacant spaces were supplied by transplanting from hills that contained more than one; many of those thus moved have failed to grow. Between the hills, nature has had full possession, and blackberry and other vines abound, with here and there a bunch of birches or a stray poplar. Some of the English oaks have started ahead at least two feet, the present season."

On the 1st of September, 1851, the following observations were made on the same plantation. "The trees vary from six inches to six feet in height. Most of them are between one and two feet high. Many of them have a vigorous, healthy aspect. Their advance, as a whole, does not come up to our expectations. The Doctor said if they had not grown, it was their own fault—as he had done nothing to prevent their growing;—and we may add, he has done little to aid their growth, since the first year. Seven-eighths of the young trees that were first observed in the hills, are still living,—many of them so involved in vines and grass as to demand searching observation to distinguish them. The English oaks show the best growth, the yellow and black oaks the next, and the white oaks stand in the third class for progress."

On the 24th of September, 1852, the following observations were made: "The trees have been permitted to progress in their own way the present season, without any culture whatever. The ground became covered with birches, briers, grasses, &c., without limit. A few days ago, all the birches, briers, &c., were cut, and the earth was stirred about the young oaks to the diameter of one foot, consequently their position was easily distinguished. They vary in height from six inches to six feet;

the greater part of them have not attained a height of more than one foot. No use has been made of the land since the acorns were planted. The Doctor suggested, it might be well, another season, to cut down the plants near the ground, and let new shoots start up, with increased vigor, from the present firmly imbedded roots."

On the 30th of August, 1853, the plantation was viewed by three of the committee, with several other gentlemen. Its condition was not materially changed, from the description above given. There are trees enough, but a small proportion of them show any inclination to rise in the world.

Upon a view of the foregoing facts, the committee could see but little encouragement for the growth of forests by planting acorns on such land. In fact, the impression was general, if the land was of any value for any other purpose, it would not pay for continuing the fence about it for this purpose. Nevertheless, they express the hope, that the proprietor, whoever he may be, will continue the enclosure, clear out the intermediate growth, cut off the plants even with the ground, and give them a chance to start anew another spring. It is much to be regretted that the Doctor could not have lived to carry through the experiment, and to give the committee and the public the benefit of his observations on a class of culture in which he felt a deep interest, and a good degree of confidence. That the experiment has been conducted, substantially, in accordance with the views of the donor, there is no room to doubt; that a better growth of the trees might have been secured, by more attention to preparing the land by subsoiling and manuring before planting, and by clean culture during their growth, is equally clear.

In view of all the circumstances, the committee are of opinion, that the experiment has been so conducted as to entitle the claimant, or his heirs, to the award of the one hundred dollars, with the interest accrued thereon, and they recommend that the same be paid accordingly.

In regard to the plantation made on the farm of Mr. Fay, once visited by the committee, they were informed that a large part of the trees were thrown out of the ground, or otherwise

killed by the frost, and that the plantation was thereby so much injured as not to be worthy of any further attention of the committee.

Respectfully submitted,

Dean Robinson, *Chairman.*

Middleton, August, 1853.

BARNSTABLE.

Report of the Committee.

During the last twenty years about one thousand acres have been planted in this county with the seeds of the pitch pine. The experiments have been successful, and the labor and capital profitably invested. The cultivation of other varieties of forest trees has been attempted, but with little success. The pitch pine is a native of this climate, hardy, and of rapid growth, and of late years, has become as valuable for fuel, as the harder varieties of wood.

Excepting for ornamental purposes, the committee are not aware, that any attempts have been made in this county to cultivate forest trees for timber. Soils that would produce trees of sufficient size are more valuable for other purposes. The white cedar, a tree found in many swamps in this county, we think may be profitably cultivated for timber, and we hope some member of the society will be induced to make the trial. A gentleman at West Barnstable, states that about five years ago, he set in a swamp, several small white cedar trees; that they have grown rapidly, produced seed, and that hundreds of young cedars have come up around them. This is valuable information, as far as it goes; it only indicates what may be done. There are hundreds of acres of swamps, now unproductive, which if planted with the white cedar, would become valuable to the owners, and be a source of wealth to the county.

A sandy soil impoverished by repeated crops of grain, is the best adapted to the culture of the pitch pine. On more fertile soils, if the seeds germinate, the young trees will often be

destroyed by the thick grass around them. On loose beach sand, the pitch pine becomes a shrub, rarely rising to the dignity of a tree. An uneven surface is preferable to extensive level plains, and a soil in which there is a small admixture of loam, to one composed entirely of sand.

The pine cones or bolls of the growth of the current year, should be gathered in autumn, before the frosts have opened the burrs, and spread thinly over a floor, and exposed to the influence of the sun and air. In the course of the winter, most of the burrs will open, and the seeds drop out. The wings should be rubbed from the seed, and when winnowed it is in order to plant. A more expeditious method is to put the bolls in pans, and set them in a spent oven. The gentle heat opens the burrs, and the seeds drop out.

The seed may be planted at any time, from the first of December to the first of April. As a general rule, nature points out the best season for sowing the seeds of plants, whose habits have not changed by long cultivation. The seeds of the pine begin to drop, immediately after the first frosts, and very few will be found in the bolls after mid winter. As the seed requires but a slight covering of earth, it should be planted early, before there is much dry weather, otherwise, it will not germinate.

A quart of clean seed is sufficient, if scantily planted, for four acres. Some plant by making holes with a hoe, drop the seed and cover with the fingers; and others plough furrows across the land, and drop the seed at the bottom of the furrows and cover with the hand. Both of these methods are slow and expensive. A man with a horse, and a machine that costs five dollars, can plant in a day, six acres, in drills six feet apart. About a foot apart in the drills, is advisable. The trees will not grow so thick, but allowance must be made for bad seed and accidents.

There are thousands of acres in this county, that it would be a public benefit to have planted with pines; they are now waste, uncultivated, and unproductive; lands that the assessors do not put upon their inventories; lands that the owners consider valueless for tillage or pasture; but priceless for railroads.

But all these lands will not be wanted in this generation for railroad purposes; they must be put to other uses, and if the nominal owners will not improve them, as good citizens they are bound to resign their title to those that will. Fuel and timber are not the sole considerations that should have an influence. Plantations of trees afford shelter and protection to the adjacent cultivated fields, rescue from sterility extensive tracts, and clothe with verdure that which was before unsightly and desolate. Facts are not wanting, that show conclusively, that forests are of public utility. Thirty years ago, if one acre, near White's Brook, had been planted with pines, it would have saved the town of Yarmouth five hundred dollars, and individuals a like sum, contributed to stop the blowing sand, which threatened to cover with desolation all the eastern part of the town.

The peninsular of Provincetown, was originally, says Gosnold, covered with a forest and "a soil one spade deep." What fires, wantonly or carelessly set, have not destroyed, the axe has cut down, and the loose soil has blown away, or been covered with huge drifts of beach sand. Thousands of dollars have been expended by the United States to fix those drifting sands, and thousands more will have to be, before it is accomplished. In like manner, the central part of Wellfleet was made a desolate waste, and the same causes are now in operation at South Dennis and Harwich, and if not counteracted, will produce like results.

Amos Otis, *Chairman.*

PLOUGHING.

WORCESTER.

From the Report of the Committee.

The history of the past goes plainly to show the plough to be the corner-stone of education. The most diminutive mind can instinctively perceive it to be the mighty instrument which paves the road to wealth, literature, and morality.

When we hear of the settlement of a new country, it is not necessary to replete our minds with the ideal pictures of imagination in order that we may unravel the hidden mysteries of futurity, so that we may know *that* nation's rise and progress; but we can more definitely define its fate by making the simple inquiry, Do they apply themselves assiduously to the science of agriculture? and if in reply we are told that they pride themselves in the arts of war, and scorn the tillage of the soil, then we shall have discerned the decree of the fates, and but a few years will serve to show that upon its course is indelibly stamped the awful decree, "Thy fate is death." But if, on the other hand, we are informed t' at their cherished pursuit is the agricultural, and the plough is the nation's pride, then will our good judgment tell us that the fairy Goddess of Justice hath descended from the etherial regions, and with her wand hath affixed upon that nation's career that beloved motto, "Prosperity is thine;" and the pages of their history will she interline with the garb of honor.

The spirit of competition, so rife in those who enlisted in the ploughing match to-day, strongly indicates that the spirit of progress, which always has so ennobled old Worcester County, has waxed strong, and that brilliant flame of agricultural advancement now blazes with redoubled energy.

The interest of the ploughing match was somewhat enlivened by the appearance of a new patented plough (the Michigan Double Mould Board) upon the field, and the noble service which it performed gave it strong claims for a premium, which would have been awarded had it not been for a diversity of opinion in the minds of your committee as to whether it should compete with those of former use. But your board of trustees made a just decision in granting this plough an equal chance hereafter with all others. To-day three of the same kind of ploughs were entered, and your committee decided that those had fairly earned a premium, which we awarded; and we have no hesitation in saying that it is injustice to debar any plough from competing with those which have received the premiums heretofore. Competition is the order of the day, and let him have the prize who wins the race. The other ploughs have years ago written their own history in letters of

gold, therefore it is useless for us to be-tow upon them our gifts of praise.

Your committee of last year, being duly convinced of the glorious results which would emanate from the introduction of the horse in competition with the ox, suggested the idea of placing them on a par in competition for the premiums. And highly gratified were your present committee in seeing that the society have encouraged the farmer to train his horse for the culture of the soil by offering a liberal premium. We were also pleased to see that some of our farmers availed themselves in the contest for the "Golden Apple." Two horse teams were entered, and the agility, conciseness, and every way perfect manner with which they discharged their labor created a feeling of surprise in our minds, notwithstanding the fixed certainty which we entertained.

Now that we have broached the subject of horse-training, we would offer another suggestion, which we candidly trust will meet with your favorable consideration—that is, that the society should offer favorable inducements for equestrian displays. Perhaps some of the more eccentric portion of the community may view this suggestion as one of too ancient a nature, or even a vindication of woman's rights, as one which should not receive your approbation, inasmuch as its tendency does not directly accord with agricultural improvements. We would say to this class, bear in mind that our aim is not chiefly to improve the soil, but to leave undone nothing which tends to elevate and ennoble the brute race. We have had a brilliant example set us by our sister States, who can most proudly boast of the eminent results of this novel but praiseworthy experiment. Should your honorable board of trustees concede this new trial of competition a place beside those which have graced our shows in years gone past, we have no hesitation in saying, that so exciting would be the spirit of rivalry that many of our fair daughters of Worcester County would appear before us at our next annual exhibition, and by their skilfulness in training the mounted steed, they would gain the applause of all, and would add more to the interest of the exhibition than aught else could do.

The character of this exhibition has been of that glorious

nature which will highly honor 1853, and give it more than equal footing in the scroll of the past. As old father time shall plough each successive year into the furrows of the past, may the interest of our exhibition gain increase until we shall have attained the goal of perfection.

OTIS ADAMS, *Chairman.*

WORCESTER NORTH.

From the Report of the Committee.

The best piece of ground that could be obtained for the purpose, was on the Fitchburg Poor Farm, in a field of some four acres, so uneven and stony as to prevent the land being laid out for the workmen in parallel lines. The soil was a deep solid loam, and somewhat stony, with a tough sward; making it a very undesirable task for the competitors, though quite as easy for the committee to determine the comparative skill of the ploughmen and the strength and training of their teams, as in a more easy and friable soil. No time was specified in which the work was to be performed, your committee believing it much more important that the ground should be well ploughed than rapidly ploughed,—though, every thing else being equal, dispatch should be considered worthy of merit.

There were eleven teams that performed their task, and taking into consideration the hardness of the soil, the task was well performed.

There were many things to be considered by the committee in judging of the merit and demerit of the various competitors. They hesitated, examined, and reëxamined the work performed, before they could satisfy their own judgments in making the awards.

A number of teams were unable to plough the required depth, (seven inches.) Some of the competitors did not turn the furrow quite flat and smooth enough to be considered perfect workmen. One or two others performed with their hands and their feet what should have been performed with the

plough. But the work, on the whole, was admirably performed,—quite as well as in any preceding year.

Some of the teams performed their work in as thorough and workmanlike manner as we ever witnessed. Not a flaw could be discovered in the ploughman, his team, or their work; and they all did their work remarkably well, abating some of the defects we have mentioned.

Before closing our report the committee wish to make one or two suggestions in relation to this important labor of the husbandman.

The plough, the harrow, the shovel, and the hoe; though varying in their forms of manufacture, are of universal use by farmers in all countries of the globe; but the plough is much more important than any other, and probably than all others put together. Either of the others could be dispensed with, though with great detriment to the farmer. But the plough could not, without clogging the wheels, and stopping the progress of civilized life. It must be used in the preparation of the soil for all of the crops of the grasses, grains and vegetables, of every nation; and he who improves the manufacture of the plough, or learns and teaches others best how to use it, ought to be considered the benefactor of his race.

Who can estimate the pecuniary advantage to the people of our own State, of New England, and the whole country, in the improvement in the manufacture of ploughs by Ruggles, Nourse, Mason & Co. and Prouty & Mears, not to mention many others engaged on a large scale in their manufacture.

The committee would express their convictions of the importance of deep ploughing in almost every kind and quality of soil. It has been required, in the ploughing match to-day, to plough seven inches; but that, in most soils, is *too shallow.* When it is recollected that the roots of many grasses descend as deep as eight or nine inches in search of food, and that the roots of many vegetables go as deep as two or three feet and more, it will at once be seen that the common depth of ploughing, at the present time—though we plough much deeper than was practised fifteen or twenty years since—is far too shallow. If the soil is shallow and poor, the more need of deep ploughing, and every time such soil is ploughed the depth should be

increased, inch by inch, until the whole surface of the ground is thoroughly pulverized, nine or ten inches from the surface; thus giving the ground greater capacity to throw toward the surface the salts that lie buried in its bosom, to mingle with the gases of the atmosphere, and thus give the greatest possible amount of food to the vegetable kingdom; and if we had but two words to say to all tillers of the ground, they should be, "*plough deep*," and more abundant and rich will be the crops that mother earth shall give in return for your labor.

JOSHUA T. EVERETT, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

From the Report of the Committee.

There are various significations given to the term ploughing; and although Webster says that ploughing means turning up the ground with the plough, yet the sailor assures us that he ploughs the mighty deep, and the Philistines ploughed with Mrs. Sampson to obtain the secret of the great strength of her husband, and many a news-monger and gossip of the present day is devotedly pursuing the same avocation, with the earnest desire of obtaining the secrets of families and neighborhoods, and they plough deep too, and do not hesitate to cross-plough until they have pulverized the whole matter.

The plough, the loom and the anvil, are often represented as the most important implements necessary to the success of the husbandman and the artisan. In one view, perhaps, the anvil should hold the first place, as with it or on it are forged some of the most necessary appurtenances of the plough and the loom, the blacksmith holding the place of chief or king among that important and respectable portion of the community known as mechanics.

It is within the remembrance of many of us when the plough share was almost wholly formed on the anvil, and a frequent resort to it was indispensable for the sharpening of the instrument.

The improvements in this most necessary implement of husbandry, within a few years, have been astonishingly great, and

your committee are of opinion that taking into view its extensive use, all the encouragement given by the Commonwealth and individual citizens to our agricultural societies, has been amply repaid by the success of the efforts for its improvement; still perfection is not probably yet attained.

Thirty years since, two yokes of oxen and a horse to lead them, were considered necessary to turn over sward land, one sturdy man well braced at an angle of 45 degrees, one to clear the plough, and occasionally ride on the beam, one driver, with ponderous goad and snapping lash, and the youngest son to ride the leader, were considered indispensable to a pleasant and successful prosecution of the work, while the whole establishment was often obliged to come to a full stop to replace refractory furrows in the rear.

We yesterday witnessed the pleasing results of the ingenuity of our plough-makers, and the facility and ease with which one man, or two men and pair, will execute more and better work in a given time, than could be performed by double the amount of strength, a few years since.

ELISHA EDWARDS, *Chairman.*

HAMPSHIRE.

From the Report of the Committee.

Was the plough used by Adam? "And the Lord God planted a garden eastward in Eden, and there he put the man whom he had formed." — Gen. ii. 8. After planting, we find that "The Lord God took the man, and put him into the garden of Eden to dress it, and to keep it." — Gen. ii. 15.

Let us, for a moment, contemplate the man, created by divine wisdom for agricultural pursuits. In his physical nature, he was a finished production of infinite skill. Intellectually, as a perfect model, he must have stood at a height that none of his descendants can hope to reach; while, upon his moral nature, no blighting stain had fallen. The lineaments of an endless life were his.

For such a man, the cultivation of the ground was deemed by the Creator, a suitable employment. But we are not in-

formed in regard to the manner in which Adam carried on his farming operations. We are not told whether he used a spade or plough, rake or harrow, hoe or corn-planter. We feel quite sure, however, that in the absence of the sons of the "Emerald Isle," he could not have relied exclusively on the spade, in preparation of the soil, even before the thorns and briers came. It will not at all surprise us, if, at some future day, a Layard should exhume from the garden of Eden the original pattern of the genuine Michigan Plough.

To the successful prosecution of agricultural pursuits, a thorough preparation of the soil for the reception of seed, is essential. One of the most, if not, indeed, *the* most, essential implement for the accomplishment of this object, is the plough. The office of a plough is to stir and turn over the soil from a suitable depth, leaving it in a light and thoroughly pulverized condition. It is not enough that the ground is simply turned upside down. A plough may be capable of doing this in the most perfect manner, and still be very imperfect; for, it is easy to see that, so far as it fails to pulverize and render the furrow light, a necessity is created for the additional labor of the harrow.

It is proper, also, in forming our estimate of the true value of a plough, to consider the strength of team necessary, and the ease with which it can be managed.

In regard to the question so much agitated at the present time, whether the plough shall run deep or shallow, we say, as a general rule, let the plough run deep, or else follow it with the subsoil. We believe that, in this conclusion, we are sustained by reason and experience. A given quantity of soil may not occupy a larger space, after having been thoroughly stirred, than it did in its natural state; still its new condition is more favorable to the growth of the plant, whose roots are to penetrate and draw their sustenance from it.

To any one who has observed the great depth to which the delicate fibres penetrate, it is perfectly obvious, that every obstacle should be removed, which might hinder their progress. Still farther, other things being equal, we suppose it to be a point which experience has fairly settled, that the ability of a plant to sustain itself during a drought, will correspond with

the depth to which the soil has been stirred, and it would seem strange, if, in a section so liable to suffer in this way as our own, any farmer should fail to avail himself of deep ploughing.

FRANKLIN.

From the Report of the Committee.

Good ploughing may truly be said to be the very groundwork of successful husbandry, and without it no man can realize such results as ought to satisfy his reasonable expectations. There is now little or no difference of opinion, among those who have examined the subject, as to what constitutes good ploughing, viz.:—a thorough disintegration, or breaking up of the soil to a sufficient depth to afford the roots of the different crops ample room to spread in pursuit of nourishment and moisture. There is far more danger of falling short of, than of exceeding, the requisite depth; and there is no doubt that a large portion of the land cultivated in New England, might be made to produce greatly increased crops, by deeper and more thorough ploughing than it now receives.

Your committee are willing that the axe, the real pioneer of civilization, should take precedence of the plough; but they claim for the cattle the second place in the respect, the gratitude and the affection of every true farmer. And they are the more anxious that its rights should be distinctly acknowledged and honored now, inasmuch as a machine has been invented which, it is claimed, will do the work of the plough more thoroughly and cheaply, and which, in the progress of events, threatens to crowd it from its position. We are not prepared to say that such a consummation is not devoutly to be wished, because it must be conceded that every real improvement in agricultural implements is a rich gift to the whole people. To such a degree of perfection has the plough been brought that it may be safely left to defend itself, by its own intrinsic merits, against any mere pretender to superior excellence. And when the day shall come for it to retire from active service, it can look back upon many centuries of honorable usefulness, and

make its exit in the proud consciousness of duty fulfilled, and destiny gracefully submitted to.

The different machines already invented to supersede the plough, on lands free from roots, stones, and other obstructions, have been so fully described in the agricultural papers, that the general principle which pervades them all, is well understood. But it may not be amiss to say, that one which has recently been subjected to several trials is described by an English writer as "quite the reverse of the plough. The latter is a *pressing*, the former a *lifting* operation; the one consolidates the subsoil, the other fractures it; the one plasters like a mason's trowel, the other lightens like a fork. The one is the operation of a wedge, the other of a lever. Hence the result is not only different, but, we may say, opposite on the soil." "We say not whether this individual implement is calculated for general use or not," adds the writer, "but we do, most unhesitatingly, that the *principle of a digging or forking machine is fully established.*"

Mr. Mechi, an eminent experimental farmer in England, says in a recent letter to the London *Times*:—"I have received from one of our North American colonies the model of a newly invented machine, which, by a happy and most simple combination of horse and steam power, will not only deeply, cheaply and efficiently, cultivate and pulverize the soil, but, at the same time, sow the seed, and leave all in a finished condition. It will also, by a simple inversion, cut and gather the grain, without any rake or other complication; while both in cultivating and harvesting, its operation will be continuous and without stoppage."

In view of the progress already made, as detailed in the foregoing extract, it can scarcely be doubted that some of us will live to see these predictions measurably realized—if not by any implement yet invented, still by one to be constructed by the genius of an age which refuses to halt short of perfection, and completely ignores the existence of the verb *to fail*. If the colonies have produced an implement which will not only plough the land, but sow the seed and reap and gather up the crop, have not the Yankees a right to complain that it only remains for some one of them to affix to it an apparatus which

will thresh, winnow, grind and bake the grain, and cull, split and braid the straw?

At the ploughing match there were in all ten entries, viz.:—three "double teams" of four oxen each, with drivers; four "single teams," of two oxen each, without drivers; two horse teams, of two horses each, without drivers; and one team of two oxen, with a driver, entered for the premium for the best specimen of ploughing with the soil and subsoil plough. The work was done in a manner to reflect the highest credit on those who performed it, and your committee are happy to say that all the premiums awarded are richly deserved. Each team ploughed one-eighth of an acre—the double teams eight inches deep, and the single teams seven inches deep.

The minimum time occupied in ploughing, (each lot having been previously furrowed out,) was 25 minutes—the maximum, 35 minutes. The committee did not, in awarding the premiums, take into consideration, at all, the comparative time of the different teams, deeming that to be of no importance. They considered only the workmanlike execution which was produced.

HUGH W. GREEN, *Chairman.*

BERKSHIRE.

Report of the Committee.

The committee on the ploughing-match having attended to their duties, ask leave to submit the following report:—Whereas the usages of the Berkshire Agricultural Society have been such for more than a quarter of a century as to render it necessary that the report on the ploughing match should be made prior to the speeding of the plough; and whereas a majority of the chairmen of the committees on ploughing have been by profession better acquainted with writing than ploughing; it is no wonder that the society has heard so much, both in prose and verse, about the beauty of an autumnal morn, the silent grandeur of Old Greylock, and the deep interest manifested by the many of both sexes that congregate around the field of competition to take a superficial view of the obedient steer that bows

his neck to upheave the tufted sod;—and so little about the one thing necessary to agricultural success—good ploughing. Your committee, with all due respect for former practical customs and opinions, have excused themselves from following round and round in the furrows of their predecessors, and would only say of the wind on the morning of the ploughing match, that all present must recollect whether it blew "hot or cold." Your committee were greatly embarrassed in the discharge of their duties. As the ploughing progressed, we applied the rules prescribed by the society, to the depth and width of the furrow, and found that there was a great deficiency. The ploughmen were informed of their errors, but still they went on, caring for nothing but to make good time and get the premium. It is sometimes said that "good beginning makes bad ending;" we are of the opinion that the work done at the setting in of the plough was not good enough to affect the poor work done at the turning out of the plough, or, in other words, the ploughing was not what the regulations of the county required it should be; neither was it what it should have been with a perfect Worcester plough, drawn by a Berkshire team, and guided by the strength and skill of a Berkshire farmer. The embarrassments of your committee were not at all removed when the last ploughman cried "whoa"; for there were awards to be made which were offered on certain conditions, and these conditions had not been complied with. Your committee were unanimous in their opinions as to what ought to be done. They also agreed that, under all the circumstances, it would not answer to withhold all the premiums, consequently they have made some awards: and call the attention of the society to the importance of having the rules of the society strictly complied with, or banish the rules on ploughing, and let every man plough according to the dictates of his own understanding, then let the committee award the premiums where the merit lies.

MARSHAL SEARS, *Chairman.*

PLYMOUTH.

Leonard Hill's Statement.

Subsoiling.—I enter my claim for a premium on an acre of Indian corn, and for subsoiling half of the same. The land is a deep clayey soil, with a hard pan beneath, mixed with gravel. It was mowed in 1851, and produced about three-quarters of a ton of English hay to the acre. In 1852 it was ploughed, and planted to Indian corn, and a good crop of about forty bushels to the acre was realized. In May, 1853, I carted on and spread ten cords over the whole acre, (five cords on each half acre,) of good barn and hog manure from Mr. Hobart's barn cellar, where he had fed twenty head of cattle last winter, and also five or six hogs. This manure was all shovelled over in April, four weeks previous to being spread on the field. On the 14th of May ploughed one-half, with a heavy plough, seven inches deep, following with a subsoil plough, seven inches deeper. The other part I ploughed with a common plough, eight inches deep; harrowed it once, then furrowed it, about three feet apart; I then put into the furrows two cords of compost, mostly soil; one cord on each half acre. I put three kernels in a hill, two feet apart, of the eight-rowed white corn, a kind I have raised for many years, (sometimes called smutty white.) The planting was done from 23d to 25th of May. On the 10th of June, ploughed and hoed both pieces, that subsoiled and that not subsoiled. On the 15th, hoed both pieces without ploughing; 22d, ploughed one furrow in a row, and hoed the two half acres; 28th, hoed and killed weeds on both pieces which had been manured and cultivated alike.

I would here remark with regard to the subsoiling, that when the subsoil is so extremely hard that the moisture cannot penetrate so easily as in many kinds of land, it is evident that subsoiling is beneficial; and in both extremes of wet and dry, I think it of use, and that it ought to be done in such soils.

In September, (about the middle,) I cut the top stalks on both parts. October 15th, the supervisor harvested and weighed two rods, selected from different parts of the field, which

weighed 103¾ lbs., which, at 85 lbs. to the bushel, is 97$\frac{55}{85}$ bushels.

October 20th, harvested and weighed the crop produced from the subsoiled part, and ascertained that to be 55$\frac{37}{85}$ bushels, and also that from the part not subsoiled, to be 45$\frac{37}{85}$ bushels; which, allowing 85 lbs. in the ear to the bushel, makes 101$\frac{74}{85}$ bushels to the acre.

Expenses:—

Ploughing, and subsoiling, ½ acre,	$7 50
Furrowing one way,	75
Planting,	4 50
Hoeing three times,	6 00
Killing weeds,	1 00
Cutting stalks,	2 25
Harvesting,	7 50
	$29 40

I have allowed nothing for carting manure.

BRISTOL.

From the Report of the Committee.

The committee on ploughing with oxen, adopted the following rules, which would govern them in their decision of the work, and made the same known to the competitors before the trial.

1st. Thorough pulverization of the soil.

2d. Narrow furrows, well turned, not less than eight inches in depth.

3d. The lots of one-eighth of an acre each, to be ploughed in fifty-five minutes.

The lands were all ploughed the required depth, and within the time, and the committee are happy to say that the work was exceedingly well performed; better, we think, than on any previous year.

The Michigan, or Double Plough, was the only one used.

J. G. Lawton, Jr., *Chairman.*

MANURES.

No subject is of greater importance to the farmer, than that of manures. On his facilities for procuring them in sufficient quantity, either from the natural resources of his farm, or from other sources, as resorting to artificial manures from the market, depend his ability to raise large crops, and, at the same time, to secure the permanent improvement of his land.

In addition to the use of barnyard manures, and such other materials as may be made from the natural resources of the farm, and the use of guano, super-phosphate and special manures, in this State, some experiments have been made in the use of tan, which, in certain sections, can be had in considerable quantity.

The value of tan may be stated in the words of a letter of James J. Conover, Esq., of New Jersey, to the Hon. William Sutton, of Salem. "About the 25th of March," he says, under date of Dec. 28, 1853, "I planted three acres, (most of it a gravelly loam) with the common Mercer potatoes. On the largest part of this, I put one small shovelful of spent tan, composted one year previously with lime, and then covered with soil. On a small portion I put our first quality of blue shell marl, and covered them as the others, and on the rest I put a shovelful of compost, made of barnyard manure and rich earth.

"The crop was light on the whole piece, and, as I did not go into the measurement of ground, I cannot give a correct account of the crop, but I was fully satisfied that the tanned potatoes yielded more bushels than either of the others, and of a far superior quality. About the 20th of April I planted three acres more, on nearly all of which I put the tan and lime compost as before, excepting a few rows, by way of experiment, on which I put tan in its raw state from the yard. On some I put barnyard compost, the same as in the other patch, and on some I put a handful of charcoal dust and ashes, which I gathered from what we call charcoal heaths here in the Jerseys, where charcoal is burned in pits or kilns, from common pine wood. Now for the result.

"No. 1. Planted with tan only, yielded me a fine crop of large, smooth, white potatoes, the best yield in the lot.

"No. 2. Planted with the tan and lime, nearly the same, but not quite so smooth.

"No. 3. Planted with charcoal ashes, the largest potatoes, but not so many in the hill; a good yield, and, taking into consideration the expense of putting on, it was quite as valuable a crop as either of the others.

"No. 4. Planted with compost from the barnyard; a good crop, but the poorest in the lot. The soil of this lot was a clay loam, and yielded one hundred bushels per acre. The potatoes were all Mercers.

"One of my neighbors composted twenty bushels of tan with one of guano, which yielded a fine crop. He thinks two of guano to twenty of tan would be better. I have carted 1,500 bushels into my cattle-yard this fall, and intend to cart four or five thousand bushels for planting potatoes. I am well satisfied that the potatoes are of a superior quality."

Experiments have also been made in turning in crops as a manure.

ESSEX.

From the Report of the Committee.

It is to be regretted that the liberal premiums offered by the society, to test the value of crops turned in as a manure, should, for several years, have failed to elicit any well-conducted experiment on this subject.

Ploughing in green crops as a means of fertilizing, has been attended with striking results, and it has the additional advantage of being a highly cleansing process. Weeds of annual growth, very pernicious to cultivated crops, may be, by judicious ploughing, very nearly eradicated. The charlick, or wild mustard, which formerly choked any summer grain on the farm of the writer, has, by this means, ceased to be any longer troublesome. By this process, the town of Haverhill, some years since, obtained the society's premium for a crop of rye, and it has been continued on their farm ever since, with decided benefit.

Some persons have objected to ploughing light land in summer, that more is frequently lost by the wind blowing off the finer parts of the soil, than is gained by turning in the weeds. But if such land is ploughed while the soil is moist and immediately rolled, this evil will be nearly prevented.

The expense of drawing manure a long distance, in addition to its high price, deters many farmers of small means from purchasing; and much of their land is imperfectly, and, consequently, unprofitably cultivated. Yet most of these persons have teams, which might perform the labor of turning in crops with very little actual cost to the owners, provided they could be assured, by decisive experiments, that the condition of their lands could be improved. And though it is not probable that land regularly cropped, can be enriched, or even kept from deteriorating for any length of time, by any process, without occasionally applying manure, yet it is believed that turning in crops, green or dry, may be found to be an important part of an enriching process.

In Mr. Porter's statement, in 1851, of the management of his farm, we are informed that turning in a clover lay constituted a part of his method of bringing his land to a highly productive state. And as he is still carrying on that system of rotation, it is much to be desired that he would furnish us with a detailed statement, from which might be learned the value of this part of the process. In other portions of the county, and even of our State, a clover lay turned in, has been considered almost essential to the successful cultivation of some soils, and no good reason is known to exist, why it should not be equally beneficial in this county.

In the absence of any claim for premium on this subject, these suggestions are offered, with the hope of inducing some one to furnish us with the result of further experiments.

JOHN KEELY, *Chairman.*

WORCESTER.

Statement of Thomas & I. S. Meriam.

The plan adopted by us in making and applying manures, is as follows: All manures used for crops remain in the yard and cellar until spring, and as soon as the yard is clear, we get into our barnyard a supply of swamp mud, which we usually get out the winter previous into piles; for our hogyard we use loam and all waste matter. Before we get it out in the spring, we collect it all together under the barn, having a cellar under the whole of the barn, but thirty-six feet is divided off and so arranged that the manure from the horse stable and ox lean-to drop into this part, and also to winter the hogs in. As soon as the frost is sufficiently out, we spread all waste hay and straw that remains in the yard, and apply plaster freely, spreading it over the whole surface; we then cart our hog manure under the barn, and spread that over the whole surface, still applying the plaster; next the heaps from under the stables, lean-tos, and yard, are spread over the whole, and another coat of plaster. At this stage, we commence and shovel it all over, mixing and pulverizing it as much as possible, then we let it remain for two or three weeks until it becomes thoroughly decomposed, and in a good state for use, having kept its full strength, and by the use of plaster we saved all the ammonia. We make, annually, about three hundred cart-loads of manure.

We apply our manure in the following manner: For corn crop, we cart with one team to the lot intended for corn, and spread and plough it under as soon as possible, not often suffering it to remain in the field over twenty-four hours, and as much less time as possible. For grass, in all cases where it can be ploughed, we do it about the first of September, being careful to turn over the furrow as smooth as possible, and follow the plough with the roller; we then apply about twenty loads of manure to the acre, being prepared as before stated, sow hay seed, harrow and roll.

We have also another method of preparing manure, in the spring, which we call guano. We generally gather from our dove house, about thirty bushels of manure, which we mix with

swamp mud and plaster, putting about eight bushels of dove manure and six hundred pounds of plaster, to a large cart-buck full of swamp mud, mix them well together, and put a small handful in the hill at the time we plant the corn. The mud, in all cases, if possible, to remain out in piles through one winter before using, so that the frosts can act upon it.

Auburn, October 24, 1853.

HAMPSHIRE.

Report of the Committee.

Every farmer has on his own farm, valuable materials for compost manure. The modes of manufacture, and of application, are well known. Let the good farmers of old Hampshire awake to the importance of making compost by hundreds of loads, and spreading it broadcast on the lands to which it is best adapted. You will double your crops, and enhance the value of your lands in like proportion. Mr. Rankin's method is worthy of imitation.

We recommend the turning in of green crops, as a fertilizer of the soil. Mr. Kelita Hubbard, of North Sunderland, has been successful, as appears by his statement of the benefits derived from actual trial, the past two years. As he has abundance of muck in his possession, we hope he will dig it out and apply it to his land, to which it is well adapted, spreading it without measure, and be rewarded accordingly.

The valuable experiments of Mr. Albert Montague, of Sunderland, are worthy of attentive consideration. Every farmer would do well to make similar trials, and he will soon know what are his most profitable fertilizers. Mr. Montague's experiments show that super-phosphate of lime, whatever may be its intrinsic value and its usefulness on other soils, is not profitable for farmers whose lands are low, wet, and cold. Providence has given him a muck swamp—he has no occasion for super-phosphate, at five dollars a bag.

Samuel Powers, *Chairman.*

Statement of Ansel A. Rankin.

In making my statement, perhaps it may be well to give the construction of my barn cellar, in which I make my manure. My cellar is sixty feet by forty. My barn points, or is open on the west side; my stables for neat cattle are on the east side, and under them, is my hogsty. Into this sty, the excrements and urine of the cattle pass. My cattle are stabled every night during the summer, as well as winter. I clear out the whole of the manure in the spring, and then before erecting the pens, I cart in as much loam as is practicable. This is done easily, as the cellar is sufficiently deep to admit of dumping the cart. I then erect the pens and let my swine commence their operations. As fast as occasion requires, I add fresh loam, and spread the excrement from the cattle, if the swine do not root it sufficiently. By this method, I have made, from six swine, one horse, two oxen, and four cows, one hundred and forty cart-loads of first rate manure. I consider the urine of as much value as the solid part of the excrement.

Pelham, October 26, 1853.

Statement of Kelita Hubbard.

I have practised turning in rye as manure, for several years, with good success. I plough my land as soon as convenient after the crop is taken off. The feed in the fall will pay for ploughing and seed. I turn in the crop in the spring, where the soil is light. I think it is equal to five loads of manure to the acre. It destroys the weeds, pulverizes the land, and thus saves much labor in the cultivation of the next year. Nearly seed enough scatters, if the crop is dry, when gathered. It can be ploughed when the team has but little to do, and can get their living in the pasture.

Sunderland, October 27, 1853.

Experiments of Albert Montague.

In these days of progress, when every one wishes to be profiting by his neighbor's experience, we are liable to do as our neighbor has done, without considering whether it will be for our benefit. We are apt to think what has produced great crops for him, will certainly fill our barns and granaries. Do we not need a *little* of the conservative, as well as much of the *progressive?* I am led to these reflections, from the fact of having, in a small way, during the past season, experimented faithfully with foreign manures, but have not received the anticipated benefit. I propose to state these experiments, with their cost and profit. My farm lies in Sunderland. The soil is sandy loam, with a trifle of marl. It is rather low, so much so, that in cold or wet seasons, corn is liable to be bitten by frost, before fully ripe, unless it gets an early start. I have usually, for this reason, put part of the manure, applied to my corn land, in the hill. Last spring I purchased two bags of Prof. Mapes' Improved Super-phosphate of Lime, and used it upon several different pieces in the following manner:—

Piece No. 1 was grass land which had been top-dressed for four or five years. Upon thirty square rods I spread thirty-seven and a half pounds of improved phosphate, which, when applied, cost one dollar twenty-five cents. Upon a piece adjoining, of like soil, in same condition, I applied the same value of rotted manure and obtained one-fourth more hay from the manured ground.

Piece No. 2 was grass land which had been top-dressed with well rotted manure. I sowed thirty-seven and a half pounds of improved phosphate upon thirty rods—which cost, when applied, one dollar and twenty-five cents. I cut about three hundred pounds more of hay from these thirty rods than from an adjoining thirty rods treated in the same manner, except that phosphate was not applied.

Piece No. 3 was broomcorn. Upon two rods I put five pounds of improved phosphate. I manured two other rods with manure from my hogpen, at the rate of ten loads to the acre, which was of about the same value as the super-phosphate. I applied both manures and phosphate in the hill. The

result was, that the two rods planted with improved phosphate produced about half as much broomcorn, as the two rods, fertilized only with hog manure.

Piece No. 4 was manured in the hill, just before planting, with improved super-phosphate of lime, put upon alternate rows. The rows where it was applied were much the largest and best colored, during the second and third hoeings—the earliest in ripening—and I think will yield fifty pounds more of brush.

Piece No. 5 was one-fourth of an acre of Indian corn, on which I applied forty pounds of improved phosphate, dropped on manure in the hill. The result was about two and one-half bushels of corn more, than on an equal quantity of ground, of similar soil, treated in like manner, except that the improved phosphate was not applied.

This finished one bag of the phosphate—the expense of it applied, was $5, and the extra amount received from its use was about $10, and my net gain $5.

I experimented, in like manner, upon other pieces of broom-corn and Indian corn, both before and after planting, and during the first and second hoeings—but could see no effects whatever from it.

I also purchased twenty bushels of oyster-shell lime, and applied it for corn; some in the hill, and some broadcast—some with, and some without manure; but, if there is any goodness in it for my soil, it is yet to be seen.

I also purchased salt to assist me in my labors to make corn grow. I put some in the hill, sowed some at the rate of five bushels, and some at the rate of one bushel to the acre. The corn all grew alike, and the worms eat it without reference to the salt.

Another experiment was successful. In August, 1853, I made a muck-heap from the swamp, and let it lie exposed to frosts and air, until about the middle of April. Then I carted it to my lot designed for corn, and there, mixing three loads of it with one load of stable manure, and one bushel of ashes to a load, which caused it to heat powerfully; I made a compost, which I applied in the hill, side by side with manure not so composted. The corn upon the compost was larger, of better

color in June and July, and was heavier when harvested. The land upon which I put it is rather poor—not my best corn land. I think the yield will be thirty-five or forty bushels to the acre. I used three loads of manure, and nine loads of muck to the acre—valued at six dollars. Others may receive great benefit from artificial manures, but some may, with me, think that so long as nature has provided, in our swamps, vast stores of that which will cause corn to grow, and the "wilderness to bud and blossom as the rose," it is best to draw upon the swamps.

SUNDERLAND, October 20, 1853.

NORFOLK.

From the Report of the Committee on Farms.

Use of Guano.—The question is frequently asked, "If guano, at the cost of fifty dollars per ton, can be profitably used on our soil;" and also, "if the benefit, where it is at all apparent, is not entirely exhausted by the crop which it first nourishes?" In reply, we have to state that a farmer in this county, while yet doubtful of its value as a lasting fertilizer, made with it the following experiments:—

A piece of grass land, which, for several years, had yielded only small return for mowing, was carefully turned up with a large grass plough, about the last week in August, stirring the soil to the depth of eight inches. It was then rolled with a stone roller and laid level. This operation was followed by using twice the large square harrow. Peruvian guano, of more than ordinary excellence, mixed thoroughly with coarse sand, —in order to spread it more evenly,—was then spread, with the hand, at the rate of three hundred and fifty pounds per acre. The cultivator was now drawn over it lengthwise and across it. The grass seed then was sown, at the rate of five pecks redtop and ten quarts herds-grass per acre. This was followed by the brush harrow, and the whole piece was left perfectly clean and level. The soil varied, in different parts of the field, from a light, gravelly, to a deep, moist loam. The seed germinated quickly, and covered the surface, before winter, with a good body of grass. This was not much injured by the severity

of winter's frost, except in a few low spots. With the return of spring the grass grew rapidly, vigorously and evenly. The first return of hay was quite two tons to the acre;—the year following the yield was larger; and for four succeeding years, it has been, at no time, less than one and a half tons to the acre, with no other manure, during the time, than two light dressings of compost.

This field was distant from the farmer's barn nearly a quarter of a mile, and he believes it would have cost more time, labor and money, to have drawn and applied manure from his barn, sufficient for the first outlay, than did the whole quantity of guano and the subsequent dressings of compost require.

To confirm this statement, he adds, that a second trial was made, next year, on an adjoining piece of nearly similar land, and with equally beneficial results. Here the effect of the guano is yet seen, after four years' cropping, in the earlier greenness and growth of the grass, both before and after mowing, compared with that on an adjoining piece of precisely similar soil, which was laid down one year later, and had received the benefit of two years' tillage and two heavy dressings of barn manure.

The piece first mentioned has since been laid down anew, at the same season of the year, with a fair dressing of barn manure, and in the spring following with a good dressing of plaster and ashes, (guano not being found at the time in the market;) but without any thing like similar results.

Greatly beneficial results have been observed, by the same farmer, from the use of guano, upon wheat and other small grains, upon corn fodder, beans, peas, cabbages, squash, and other vines, young fruit trees, currant and other bushes. Indeed, there is no article of horticulture or field culture to which the judicious application of this manure, would not, he believes, be of great service.

The experience and observation of this farmer lead him, therefore to venture the opinion that our farms would be, in all respects, benefited, and the expense of cultivation lessened by a judicious and liberal use of guano, wherever barn manure, though it were a gift, must be carted more than half a mile. In this opinion he is confirmed by the extraordinary effects

produced on the nearly exhausted soils of Virginia, and Maryland, and Kentucky, and North Carolina, of which reliable accounts are given in the publications of the day.

Phosphates and Super-phosphates of Lime.—Of the value of these fertilizers and their effects, neither experience nor observation enables us to speak with confidence. From the remarks made to us by judicious and intelligent farmers, and from the favorable accounts, which we presume are in all respects reliable, given of experiments made with them, we are induced to urge upon the farmers of this county the careful and thorough trial of their use in different modes of operation, and upon different sorts of vegetable culture. We believe that every new discovery in this department of agriculture, and every instance of the successful application of concentrated manure to the soil, is of vast importance to the farmer, and will help to lessen the hardships of his occupation, to increase the sum of his gains, and to enlarge the opportunity for his rest and intellectual and social enjoyment and improvement.

PLYMOUTH.

Report of the Committee.

In respect to the preparation for manure, it should not be forgotten that the excretions voided by an animal,—a cow or an ox, for instance,—during the time when usually housed and yarded, if carefully saved and properly composted, with good facilities for doing this, are capable of converting into valuable manure only a limited quantity of absorbent material. What is that quantity? This, of course, will depend, in some degree, upon the nature and amount of the food consumed. What is the quantity, then,—or, rather, what is the maximum average of such material, estimated per head, to which the excretions from an ordinary stock of neat cattle, as generally kept, can be made to impart the virtues of good manure? This is a very important question, any thing approximating to a correct solution of which, would greatly facilitate a just estimate of the value of the composts offered for premium, composed, as they generally are, mostly of such ingredients. Many farmers

of judgment and experience would not, I apprehend, set this average much, if any thing, above eight or nine common ox-cart loads; which would give, probably, one hundred and fifty, or one hundred and sixty loads as the aggregate amount that could be made from a stock consisting of ten heads.

The chief concern with us appears to be with regard to the quantity of manure. Philosophers, on the other hand, affirm that, in a practical point of view, more depends upon the quality than the quantity. Let us not be unmindful of this; and, however the fact may be, let us always take care to make and apply only such composts as are adapted to cause abundant harvests, and to benefit good soils.

JOHN E. HOWARD, *Supervisor.*

Statement of Jonathan Howard, 2d.

I have measured and composted, since October, A. D. 1852, 685 loads of manure, as follows, viz.: 580 loads in the barn-yard, one-fourth from muck, and the remainder of soil from sides of fences, ditches, and coal-dust, mixed with the droppings of eighteen head of cattle wintered, and sixteen head kept through the summer, and one horse. In the warm season the droppings were collected every morning from the yard, and thrown into the cellar under the barn, which is 38 by 50 feet, and there intermixed with coal dust and muck, and covered to prevent evaporation.

Seventy-five loads were made in the hog-yard, where four swine were wintered and eight summered; and about three-fourths loam and one-fourth muck, with potato vines and weeds, formed what was thrown in at different times.

Thirty loads composted as follows: 5 loads muck, 10 loads scrapings by side of road, 10 loads loam that had received the wash from a sink spout, and 5 loads from the bottom of an old hog-yard, and 10 bushels salt. The dimensions of the cart in which it was measured, are $6\frac{1}{2}$ feet long, $3\frac{1}{2}$ feet wide, and 20 inches high.

Amasa Howard's Statement.

Being interested in the trial for the greatest quantity of manure, I send the following statement of the manner in which mine was made:—

The offal from my slaughter-house, and the manure of four horses is dropped into a cellar below, where are kept four hogs. From this cellar I have taken 114 loads of green manure; 51 loads were made from my barn, where were kept one yoke of oxen, four cows, and a yearling. From my hog and barnyard, the former having had the wash of the house, 286 loads, composted with soil and muck, were taken; 88 loads from the various other out-buildings were scraped together, adding material as required. By this calculation, I find I have made 539 loads, of 40 cubic feet each, during the past year.

Horace Collamore's Statement.

Having entered as a competitor for the premium offered by the Plymouth County Agricultural Society, "to the person who shall make the greatest quantity of the most valuable compost manure," I will state that my stock, the last year, has averaged about eight head of neat cattle, two horses, and three swine; that I have a barn cellar, one-third of which is appropriated for a hogsty, and for the repository of the droppings of the cattle and horses, when housed; and into which is almost daily thrown swamp mud and soil, chip-dirt, &c., to be mixed by the swine.

A large proportion of my farm being sandy, we cart about 200 loads of swamp mud into the barnyard and hog-pen, in the fall; this receives the droppings of the cattle and swine during the winter, and, as soon as the frost will permit in the spring, is frequently ploughed and harrowed, and in June is heaped up in large winrows, with the scraper, and left to ferment, till wanted for top-dressing for grass lands or other purposes.

For our low meadow lands we make a compost soil, obtained from the hedgerows around the fields, intended for our corn

crops, by ploughing two or three furrows next the fences, and composting with barn manure.

With a liberal supply of soil and vegetable matter, we make from our sink and vault about 20 loads of fertilizing manure yearly.

In addition to these resources, we have, the present year, made 130 loads of valuable mud compost, as follows:—The mud was dug and drawn on to the upland last fall; as early as practicable this spring it was heaped up, and 150 bushels of leached ashes and seven casks of lime mixed with it; this was dug over, pulverized, and thoroughly incorporated with the ashes and lime, during the summer, and used as a top-dressing for grass on my sandy soils. By this method, and from these sources, I have made and applied, the present season, 446 loads of valuable compost manure, of 40 cubic feet per load.

INDIAN CORN.

Report of the Committee.

Great discredit is often thrown on the statements of individuals, arising in part, from the unfair mode of measuring. Many of the committees complain that the entries were so few, and account for it, by the fact that the premiums offered, are so small as not to pay for the time and care of measuring the crop, in compliance with the rules of the society. It would seem that a proper regard to truth, and justice to other parts of the State, should induce committees to require the utmost strictness in measurement; and to prevent any discouragement, that the societies should offer such premiums as will compensate for any amount of time which may be required. The committee of the Franklin Society, speaking of the excellent crop of one who entered for a premium, say he "only harvested and measured the crop from a few rods of his field, and from that made an estimate of the whole field, which, in the opinion of the committee was not a compliance with the regulations,

therefore he can't come in, however good looking." This is as it should be; and if all societies would require such a strictness as would secure the confidence of the community, their returns would be far more valuable. The same committee speak as follows:—

"In conclusion, your committee wish to call the attention of the community in general, and of the society in particular, to the fact, that so very few applications are entered for premiums, where so many ought to be; and, especially, to the importance that those who do make application, should, in every instance, make their statements in strict accordance with the regulations of the society, as published in the pamphlet that is distributed among the members. The amount of land and quantity of the crops should, in every instance, be clearly and accurately stated and vouched for, according to the published regulations. The importance of a strict compliance with these regulations must be manifest to all. Nothing is, or can be so embarrassing to a committee, whose duty it is to decide between the different claimants, as any inaccuracy or want of precision in the papers before them.

"Your committee therefore unanimously recommend that, in future, no claim for premium shall be considered unless the same has been made and filed with the secretary, in strict compliance with the published rules and regulations of the society; and that members and others, making, or intending to make, entries for premiums, may regard this as necessary from the outset."

There is also a fact which has been overlooked in the statements of the amount of corn per acre, ascertained by weight, which is, that certain varieties shrink more than others, so that though they may appear to produce more than other varieties, they may be inferior in weight when thoroughly dried and measured. The variety of corn should, therefore, be mentioned in every statement for a premium.

Farther experiments are wanted to ascertain precisely the difference in shrinkage, of the different varieties of Indian corn. To show, to some extent, how great this difference may be, a letter was written to John E. Howard, Esq., supervisor of

the Plymouth Society, from whom was received the following reply:—

"Wishing to compare, in respect to shrinkage, the variety of Indian corn known in this vicinity as the 'Whitman corn,' or 'smutty white,' as it is sometimes called,—a kind to which some farmers here appear to be very partial,—with that of an eight-rowed yellow which I had raised for a number of years, I procured for the purpose, some of the former from Mr. Calvin Leavitt, of Bridgewater. The ears sent me by Mr. Leavitt were from a crop raised by him, in 1852, for which he had taken, that year, the first premium; and of which the yield, as reported by Mr. H. Collamore, then supervisor of the Plymouth County Agricultural Society, was one hundred and twenty-two bushels to the acre. From the sample received, (fine looking corn it was,) I shelled, on the 10th January, 1853, eight quarts, which weighed at that time fourteen pounds and four ounces, being at the rate of fifty-seven pounds to the bushel. I also, at the same time, shelled from some ears raised the same season, and taken from the crib, an equal number of quarts of the aforesaid yellow,—a handsome, although not, I presume, an unusual variety, with large kernels, which, however, were not so large as were those of the smutty white. These weighed fifteen pounds and eight ounces, being at the rate of sixty-two pounds to the bushel.

"The several parcels were then spread upon the floor of an upper loft in my corn-house, where they remained securely until the 21st April following;—when, on being again weighed, the smutty white gave twelve pounds and eight ounces, and the yellow fourteen pounds and twelve ounces. The first having lost, in weight, from the 10th January to 21st April, one pound and twelve ounces, being at the rate of seven pounds to the bushel; and the other, twelve ounces, being at the rate of three pounds to the bushel.

"The trial, I am sensible, was begun too late in this case, and conducted upon too limited a scale to prove as satisfactory as it otherwise might have been. But the facts which appear to be disclosed seem to deserve attention, and to be of a nature requiring a further and more thorough investigation of the subject, going to show, as they do, substantially, that of two crops

of corn of the foregoing varieties, the yellow measuring, on the first of January, eighty-five bushels, and the smutty white measuring, at the same time, one hundred bushels, the aggregate weight of the former, at the expiration of the short period of four months, will be greater than that of the latter. Thus giving, moreover, probability to the supposition that similar differences may be found to exist, to a greater extent than is generally imagined, among other varieties of corn between which no comparison with reference to the particulars referred to, has yet been instituted.

"The greater lightness and tendency to shrink of the smutty white, as above shown, may be, in some measure, or wholly, accounted for, perhaps, from the fact of its being derived, in part, from the Southern white, to which, I believe, it bears a resemblance in the principal features of its organic composition."

ESSEX.

From the Report of the Committee.

The season having been so favorable for the growth and maturing of the corn crop, it was with some surprise that the committee found so few entries of this staple production. Indeed, we do not remember to have heard so many farmers, as we have this year, say that their corn crop never was better. We only wish that more of these crops had been entered for premium, but the premium of six dollars offered by the society is hardly large enough to induce farmers to go to all the trouble of the exact measurement of their land and crop, required by the rules. We would suggest that larger premiums, and more of them, be offered to excite a spirit of greater competition in this direction. Considering the intrinsic value of this crop, and the many uses to which it is applied, and especially considering that as large crops are seldom raised as might easily be raised, the culture of Indian corn should receive more encouragement.

FRANCIS DODGE, *Chairman.*

George Hayes' Statement.

I wish to enter for premium a crop of corn raised by me on the farm of the late Thomas Bancroft, in Beverly. The land contained one acre, as measured by a sworn surveyor. It had been in corn and potatoes the year previously, 1852, but how manured, I am unable to say, as it was then carried on by another person; but the land is of good quality. It was ploughed last spring, and manured in the hill with a compost of barn and hog manure and sea weed—a good shovelful to the hill. It was planted about the first of May, and though so early, the corn came up well, with a good strong growth. It was cultivated and hoed twice thoroughly, and weeded once after haying, so that the ground is left entirely free of weeds. Thorough weeding and stirring of the soil I consider of more importance to secure a good corn crop than high manuring. The corn was topped about the middle of September, and harvested early in October. It was measured in the ear in bushel baskets, and found to contain one hundred and forty-four baskets of sound ears. The corn has lain in the bin ever since, and this morning two baskets of ears—the same baskets as were used in measuring before—were shelled and found to contain sixty-two pounds of shelled corn.

The corn is the eight-rowed corn. It was planted three and a half feet apart—five stalks left in a hill, and many of the stalks produced twin ears.

Beverly, Nov. 14, 1853.

Hermon P. Chandler's Statement.

I offer for premium one acre of corn and white beans, from which I harvested one hundred and forty-six baskets of ears of corn. Planted in 1852 with corn—yield about seventy bushels of shelled corn per acre. Ploughed in the fall. It was manured in the spring of 1853; seven cords of compost manure, two-thirds of it spread and ploughed in, and the remainder put in the hills. Planted the 20th of May with the golden Sioux corn; hills three feet eight inches apart each way—four stalks to the hill. After the corn was up, planted the beans beside each hill

of the corn—yield of beans, five bushels. First of November I shelled two baskets of ears, which weighed sixty-seven pounds. Allowing fifty-six pounds to the bushel, it makes eighty-seven bushels and twenty-one fifty-sixths. Corn was harvested the first of October. The corn was hoed twice, the ground kept level as possible. Stalks cut first of September. Amount of labor, about eighteen days' work—the value of the land, seventy-five dollars per acre.

ANDOVER, Nov. 14, 1853.

Amos Poor, Jr's, Statement.

I present, for examination, one and a quarter acres of corn; where the corn grew grass was mown in 1851; in 1852 it was planted with corn and potatoes and was manured in hills. The present year fifteen cart loads of manure to the acre were ploughed in, and a small quantity of manure put in the hills; it was planted four feet between the hills each way; planted the 12th of May; hoed three times; harvested about the middle of October, and yielded two hundred and fifty-seven baskets of sound corn, weighing forty-five pounds ten ounces to the basket, making the whole weight on the acre and a quarter, 11,725 pounds.

WEST NEWBURY, Dec. 5, 1853.

I hereby certify that I measured a piece of land for Amos Poor, Jr., which measured two hundred rods, on which he raised two hundred and fifty-seven baskets of ears of corn the present year; I also weighed one basket full of ears, which weighed, exclusive of basket, forty-five pounds ten ounces.

SAMUEL ROGERS.

WEST NEWBURY, Nov. 29, 1853.

MIDDLESEX.

Statement of Josiah Bigelow.

The field of corn I offer for premium contains two acres and twenty-eight rods, is sandy loam, and was in grass in 1851. Ploughed in the spring of 1852—eight or nine inches deep,

partly with the Michigan plough, which I prefer—manured with about twenty loads of compost per acre and harrowed as well as possible without disturbing the sod—planted about three feet each way—applied a little guano and bone, mixed with plaster of Paris, to the hill—but, together with the bad condition of the seed, (smutty white, or, as it is sometimes called, the Whitman, I believe,) worms and unfavorable weather, the average was about one kernel to the hill that matured, notwithstanding it gave a yield far beyond my expectation, of about thirty-five bushels to the acre. This land for years previous produced about three-quarters of a ton of hay to the acre. In the fall of 1852, the land was ploughed about eleven inches deep, harrowed in the spring of 1853, and forty loads of good compost manure, made by cattle and hogs, mixed with dry muck, were spread on the whole field and ploughed in about six or seven inches deep, harrowed and furrowed about seven or eight inches deep—running the plough twice in each row. By the deep furrowing it allowed the hills to be rather below the surface, allowing the water from showers to settle about the hills, and also favoring the flat cultivation; manured about thirty-five loads of good compost on whole field, so that the hills would average a little inside of three feet apart (the rows being three feet three inches distant). Planted the smutty white corn, (selected from the field of last year, about three weeks previous to gathering it, by taking the ears that matured first, and best filled out,) about four and five kernels to the hill, the second week in May. Run the plough between rows for the first hoeing, and the cultivator for the two last. It appeared to suffer very little by the drought and ripened all of two weeks earlier than last year, which I think is in consequence of selecting the seed as above mentioned.

The second field, containing one acre and sixty-eight rods, mentioned in the annexed report, I did not intend to have named, as we did not suppose the yield would be equal to the first, although it was manured quite as well and closer planted, but it was a yellow corn, very large growth of stock, which I supposed would be small, consequently it was seeded too highly, and the result was the greatest profusion of stalks that

perhaps, was ever witnessed in this neighborhood; and, up to the first of August, I despaired of having much else; but it came on very rapidly the last of the season, and matured quite well, considering the large growth of stalk. As we supposed there would be less than first field, (of two acres twenty-eight and a half rods,) the committee did not take the pains to ascertain the quantity as they did the first field reported, but cut up and shelled four square rods in one place according to my desire—not to take the trouble of going over the field and take separate rods as in the other field—but it so happened that I gathered that field first, and to give place in my barn it was husked and measured, and the result of sound corn two hundred and seventy-six bushels, beside some thirty bushels of soft corn, making between one hundred and ninety-three and one hundred and ninety-four bushels of ears to the acre of sound corn.

You will allow me to say that it was not my intention in planting this corn to offer for premium, and that I have not kept any very minute account of all the expenses attending, but would say, according to the best of my knowledge, that cost of labor and worth and cost of manure is about the same in this place as it is in other sections of our county, the same distance from Boston, say from twenty to thirty miles, and prefer to leave it to others to run out the calculation of profit or loss, as shall best suit their own ideas, from the items I have given in this report.

Groton, 1853.

The undersigned certify that they gathered and measured the corn grown upon four square rods of land, of a lot which measures two acres and twenty-eight and a half rods, and found the yield to be at the rate of one hundred and six bushels per acre.

The undersigned also gathered and measured the corn grown upon four square rods of land of another lot, which measures one acre and sixty-eight rods, and found the yield at the rate of eighty bushels per acre.

Said corn was raised by Josiah Bigelow, Esq., and gathered on the day of October.

Geo. S. Boutwell.
J. S. Adams.
Wm. Shattuck.

WORCESTER WEST.

Statement of George H. Lee.

I hereby certify that I have harvested one hundred and five bushels of corn, the present season, from one acre of ground. The manner of culture is as follows:—The green sward was turned early in spring, and immediately after about twenty loads of stable manure were applied per acre, after which it was harrowed once and thoroughly mixed with the subsoil. The corn was planted about the 20th of May, in drills. Previous to weeding, about a table-spoonful of plaster of Paris was applied to each hill. It was hoed three times; the last time about the first of August.

BARRE, Nov. 7, 1853.

Statement of Nathan S. Walker.

My acre of corn yielded eighty-nine bushels, weighing 61.61 to the bushel, making 5,484 pounds. The ground was broken up last November, and I put on thirty loads barn manure, spread one half upon the top of the furrow, and put the remainder in the hill. Furrowed one way, three and a half feet apart, and planted two and a half feet apart in the rows. I used an ox cultivator to work in the spread manure, and a cultivator between the rows, and hoed three times.

BARRE, November, 1853.

Statement of Calvin Earl.

The land contained one acre—surveyed by a practical surveyor. In the fall of 1851 the land was turned over from eight to ten inches in depth. In spring of 1852 it was well manured and planted with corn, and I had a noble crop. In spring of 1853 I ploughed about fourteen inches deep, and spread on fifteen to twenty loads barnyard manure, and harrowed well. After the land was furrowed three and a half feet apart one way, and two and a half the other, I planted with a small shovelful of manure in the hill, and hoed twice.

August 20, cut stover from four rows, ten rods long, which

weighed 273 pounds, equal to 5,089 pounds in the whole. September 3, cut stalks on four rows, which weighed 353, equal to 6,530 in the whole, green. October 20, harvested the corn, which measured one hundred and eighty-four and a half bushels of ears, equal to ninety-two and a quarter bushels shelled corn, which weighed 6,646 pounds. The husks from four rows weighed two hundred and six pounds, equal to 3,811 pounds, in the whole, weighed dry.

Recapitulation:—

92¼ bushels corn, weighed 6,646 lbs., at 95 cents,	$87 64
3,811 lbs. husks, $5 per ton, ...	9 53
5,050 " stover, $5 "	12 62
6,530 " stalks, $5 "	16 32
	$126 11

Hubbardston, Nov. 29, 1853.

WORCESTER NORTH.

Joel Hayward's Statement.

The land on which my corn was raised was planted with potatoes last year. Last spring fourteen loads of green manure were spread and ploughed in, and thirteen loads of compost put in the hill. The corn was planted May 3d. Corn, Tuscan white.

27 loads manure, ...	$27 00
Ploughing, ...	2 00
Teaming and spreading manure, ...	2 00
Planting, ...	4 00
Hoeing, ...	6 00
	$41 00

This field had twenty and one-third hills to the square rod, the ears weighing 46½ lbs. to the rod, making ninety bushels to the acre.

Ashby.

Daniel Works' Statement.

The land on which my corn was raised was part sowed and part planted last year. Last spring twenty loads of green manure and ten loads of compost were spread and ploughed in. No manure was put in the hill. Corn hoed but twice.

30 loads of manure,	$30 00
Ploughing,	2 00
Spreading manure,	3 50
Furrowing and planting,	2 83
Hoeing,	7 00
	$45 33

This field had 32½ hills to the rod, the ears weighing 44½ lbs., making eighty-six bushels to the acre.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of George Dickinson.

The piece of land on which the corn was raised, contains four acres and ninety rods, and yielded two hundred and ninety-seven bushels and fifteen quarts of shelled corn; weighing fifty-four and a half pounds to the bushel, or sixty-three bushels and five-ninths per acre, weighing fifty-six pounds to the bushel.

The land is first quality meadow land—a deep, heavy loam—and previous to 1852, most of it had lain in grass for eight years, producing two crops each year, without any top-dressing. In the spring of 1852, it was ploughed to the depth of eight or nine inches, and manure applied. It was planted then to broomcorn. The manure was put into the hole, at the rate of nine loads to the acre. This crop yielded about seven hundred pounds brush to the acre, and a fair crop of seed.

In the spring of 1853, the land was ploughed about eight inches deep, twelve loads of manure to the acre, spread on and harrowed in, and planted the last days of May. It is estimated that the crows pulled, on the whole piece, nearly a quarter of an acre.

The corn was cut up and stacked the third week in September, and husked in October, and the account stands as follows:

	Dr.	
Team and hand labor, ...	$87 75	
54 loads manure, ...	54 00	
Interest on land, ...	54 00	
Taxes, ...	5 00	
		$200 75
	Cr.	
By 297½ bushels corn at 80 cents, . .	$238 00	
Corn fodder, ...	27 00	
		$265 00
Net, ...		$64 25

HADLEY, November 14, 1853.

HAMPSHIRE.

Statement of N. & B. Smith.

The piece of corn we offer for premium, contains one acre and five rods. It was mowed three years previous to 1853, and not manured during that time. In December, 1852, it was ploughed with the Michigan plough, eight inches deep. A compost was made upon the lot—containing about twenty loads of clear manure and thirty bushels of oyster-shell lime, slacked in a brine made from two bushels of salt. This compost was spread upon the furrows and harrowed in. The corn was planted by a corn-planter, on the 14th of May. Ten bushels of shell lime and ashes were dropped by a machine. The corn was hoed three times, and grass seed was sowed at the third hoeing. On the tenth of September, we harvested the crop.

Value of crop:—

98 bushels, 22 quarts, at 92 cents, . .	$90 80	
4 baskets soft corn, ...	1 00	
3 tons of fodder, at $5, ...	15 00	
		$106 80

Expenses:—		
20 loads of manure,	$20 00	
30 bushels of lime and 2 of salt,	3 75	
Ploughing, hauling manure, &c.,	8 00	
Spreading manure and harrowing,	2 00	
Planting and seed,	1 00	
Hoeing and cultivating,	10 00	
Cutting and stacking,	3 00	
Carting and husking,	8 00	
Interest on land,	6 00	
		$61 75
Net gain,		$45 05

SUNDERLAND, November 15, 1853.

Statement of R. T. Wheelock.

The acre, on which my crop of Indian corn was raised, is part of a field of three and three-fourths acres, in Amherst. This field is a hard, stiff, loamy soil, resting on a subsoil of gravel, with a sprinkling of cobble-stones. It has been pastured. About six years previous to my laying it down to pasture, it had been apparently exhausted, by cropping, of every article of food, capable of nourishing plants. In 1841–2, I attempted to cultivate this lot, and the result was nearly a total failure. So lifeless was the soil, after turning it with the plough, that neither sunshine, rain, nor good cultivation, seemed to pulverize it, or to render it capable of sustaining a poor crop. Two methods of procedure suggested themselves to my mind; either to manure liberally and continue to cultivate, or to stock it down to pasture for a few years. The latter course, I adopted. I sowed it with rye and stocked it down. The seed took remarkably well, and, judging from the appearance of the pasture, from year to year, I thought it gave unmistakable signs of improvement. Last spring, I concluded to make one more trial. About the first of May, I commenced ploughing it from six to seven inches deep; and, to my surprise, I found a thick, rich, heavy turf. On working this, it pulverized immediately after coming in contact with the atmosphere. I harrowed the land twice, manured in the hill, at the rate of eight loads to

the acre, using a compost, one-half from the barnyard, the other half from the slaughter-house. I hoed three times, and ashed one-half of the field after the first hoeing. The corn was cut and stacked, about the middle of September, and husked, the last of October. The yield was one hundred and twenty-five bushels of ears, equal to sixty-two and one-half bushels of shelled corn. The whole field yielded three hundred and seventy-one bushels of ears. I think there was a loss of from five to eight bushels per acre, in consequence of an east wind, about the last of July, which prostrated it flat upon the ground.

Value of crop:—

62½ bushels, at 83 cents, ...	$51 87	
1½ tons of corn fodder at $5, . . .	7 50	
		$59 37

Expenses:—

Ploughing, ...	$3 75	
Manure, and spreading it, ...	9 00	
Planting, ...	1 50	
Hoeing, ...	3 00	
Seed, ...	25	
Cutting and stacking, ...	2 00	
Husking, ...	3 75	
Drawing to the barn, ...	1 00	
Interest on land, ...	4 50	
Ashes and ashing, ...	1 00	
		$29 75
Net gain, ...		$29 62

AMHERST, November 17, 1853.

HAMPDEN.

Report of the Committee.

The committee remark that the cultivation of corn is a subject in which every farmer is most deeply interested; it is like iron among the metals, the most common and still the most important; it will be seen by the official report of the Patent Office, 1851–2, that the aggregate of this crop is more than

five times that of wheat; see the figures used:—100,479,150 bushels wheat, and 592,141,230 of corn; of which Massachusetts gives but 31,221 of wheat, and 2,345,490 of corn. These figures suggest material for many remarks which might be offered, but we leave them, with all their importance, to the consideration of those who *think for themselves*. In presenting the statement of our only competitor on this crop, we may be permitted to remark, that, having a personal acquaintance with him and his accuracy in all the details of his agricultural pursuits, we derive much pleasure in presenting his successful results to the public, through our medium, and earnestly do we indulge the hope that his statement will stimulate many to excel him in the field of his success.

J. C. Parsons' Statement.

I wish to offer for premium the corn which I have raised this season, upon sixteen acres of land. Four acres of this was planted to corn last year, and for which I received a premium from your society; the rest of it had been in grass for three years, and produced about two tons of hay to the acre. In May last, two hundred and fifty-four loads of stable manure, equal to one hundred and twenty-seven cords, was spread upon this land and ploughed under. It was also manured in the hill with compost, made from hog manure, muck, ashes, and sizing, and planted three and a half feet apart each way. It was cultivated and hoed three times, and, after the first hoeing, it had a handful upon each hill of ashes, plaster and hen manure mixed.

The yield was 2,512 bushels of ears, equal to 1,256 bushels of shelled corn, or 78 bushels to the acre. I have weighed and shelled one basket of the corn, (one and a half bushels,) which weighed as follows:—corn, fifty-one pounds; cobs, sixteen pounds; both, sixty-seven pounds; one-half bushel of shelled corn weighed thirty pounds.

I estimate the cost and value of the crop as follows:—

1,256 bushels corn, at 90 cents, .	. $1,130 40	
Corn fodder, at $10 per acre, .	. 160 00	
		$1,290 40

Cost of 254 loads manure, at $1.50, .	$381 00	
" compost, ashes, &c., . .	75 00	
" cultivating and harvesting, .	225 00	
" interest on value of land, .	100 00	
		$781 00
Balance in favor of crop, ...		$509 40

AGAWAM, November 23, 1853.

BERKSHIRE.

From the Report of the Committee.

Your committee are not alone in believing that in no season since Berkshire ceased to be the hunting ground of the red man, have her fields presented a state of so high and judicious culture, or returned to their owners so large a remuneration for their cares and their toils. "Old and worn-out soils," "degenerated and fruitless soils," "inhospitable skies and sterile grounds," are epithets which may do for poetic figures, to grace a stump speech or Fourth of July oration; but the crops shown to us, in our survey of the county, have taught us that this language belongs not to those farmers with whom we have had intercourse, or the grounds which they occupy. If it is true in reference to those who are not active members of this society, our language to them would be, come with us, adopt the modes of culture which the observation and experience of the age has shown to be judicious, and the same skies and the same fruitful fields shall be yours.

To the same class of "poetic figures" would we assign the language we often hear, that little has been done for the promotion of agriculture; that while every thing else has advanced with rapid motion, agriculture has remained comparatively stationary. Now when you place the reaping machine by the sickle; the threshing machine by the flail; the plough of to-day, with that of former years; the cultivator and harrow with plate steel teeth, by the old drag and bush; the beautiful, light, elastic two, four, six, eight, ten and twelve-tined fork of a Partridge, with the old bug horn; the barn and barnyards, the stables and sheds of a Leavitt, a Harrison, a Colt, a Joiner, and many

others in this county, with the things of the same name, once the best of the class; the tenants of these yards, stables and sheds, with their ancestors; the hog-pens and their five hundred pound Suffolks, with the swordfish-nosed street scavenger of olden times; the French, Spanish or Silesian merino, giving more wool from his necklace and pantalets than flocks used to give from the entire animal; the tillage of the soil and the crops produced by this tillage, under the direction of the farmer of the age, in comparison with those of other years; and last, but by no means least, when you place the mind, the enlightened, faithful, working mind, now devoted to the object, and acting through the agricultural journals, the addresses and lectures, the application of science to agriculture in the school and in the field; mind, investigating mind, pointing out the laws of vegetable life and vegetable growth, showing the food best fitted for that growth, and establishing the law of rotation for crops in accordance with the law of growth, the mind thus devoted to the advancement of our cause, (and devoted mind is the surest criterion of progress the world has yet discovered,) in contrast with the mind thus devoted, only a quarter of a century ago; you will have the evidence of the progress made. In the face of all the taunts at the snail-like pace with which agricultural improvement is said to have advanced, we challenge the world to produce an equally rapid advancement in any other department of life's duties.

So great has been the change in the amount of an acre's production, that we have been cautioned repeatedly against reporting the full measure, lest we bring distrust on all our doings. But here permit us to say, we have made no estimates. We have examined hundreds of crops in the field, we have examined them thoroughly, honestly and faithfully, we have taken into account the soil, the location, the tillage, the present crop in comprison with that of the last year, and the prospects for the future. In the corn-field, we have measured one rod carefully and accurately; so measured it that the adjoining rod on either side should be as large and contain as many hills as the one taken, and so measured it that it would require one hundred and sixty such rods for an acre. We have designed to take it, not from a manure heap, but a fair specimen of the bet-

ter part of the piece, and in comparing different pieces, to give, of course, evenness due consideration.

We have picked this rod, husked it handsomely and weighed it accurately, as truly so as if we were selling or buying. How much this corn would shrink, how much any grain or roots will shrink between harvest and the other side of a cold winter is not given us to decide. For ourselves, we believe the shrinkage is twice as great as is generally supposed, but this is not the question. That it will shrink, every person ought to know, and they are at liberty to make any allowance deemed just. In grain we made no measurement. Some results were reported to us after our awards were made, by men in whom the world put full confidence on all other subjects; why should they not on this?

Of the three-acre pieces of corn, that of Mr. Sears, of Lenox, was eight-rowed and very dry; forty-two hills to the rod, yielding sixty pounds. The ground of Mr. Belden, of Lenox, was sward land, ploughed in the fall; twenty-five loads of compost two parts muck and one manure, harrowed in; thirty-five hills to the rod and fifty-six pounds.

Of the one-acre pieces there were thirty-four entries.

Mr. Shepardson, of Lanesboro', showed us corn ground thoroughly tilled and heavily manured. Twelve-rowed corn, planted closely. The rod gave seventy-eight pounds.

The ground of Mr. Hinkley, of Lee, was ploughed once last year, received fifteen loads of long manure and gave forty bushels of corn. This season twenty loads of long manure were ploughed in seven inches, and fifteen loads of compost harrowed in; four bushels of ashes and plaster applied to the field after first hoeing; corn, twelve-rowed, white and yellow mixed, planted 18th and 19th of May, four kernels in hill, hills three feet by two and one-half, and cultivated twice and hoed twice, hills raised very little. The rod gave sixty-nine pounds.

The ground of Mr. Smith, of Lee, was sward; forty ox-cart loads of manure from the barnyards and pig-pen were ploughed in, eight inches deep, in April, harrowed thoroughly. Planted, 14th of May, with Vermont Dutton corn, hills three feet by two and a half, and cultivated, four stalks left in a hill; hoed three times, raising hills but very little. A handful of a mixture,

nine parts ashes and one plaster, was put in hills, and a small amount of ashes and plaster applied after first hoeing—seventy-one pounds to the rod.

The fields of Mr. Hinkley and Mr. Smith were neighbors in more senses than one, and very close competitors, giving each very heavy crops, but it was thought that the entire acre of Mr. Hinkley would carry the most dry corn to the mill.

It would give us pleasure to have the men who talk so learnedly of the ignorance of the farmer, and the go-to-mill-with-a-stone-in-one-end-of-the-bag manner of conducting his business, examine both the farms and the farmers between the railroad at Lee and Stockbridge Plain. We do not say there are not better places in the county, of four miles in extent, but we would rest the question on this ground.

The corn of Mr. Chamberlain, of Williamstown, was among the slate hills of the Taconic range, a little more than a stone's throw from Vermont, on an old sheep pasture, planted without manure—sixteen acres in all, affording a difference in soil and crop. We picked a rod of thirty hills, twelve-rowed corn, sixty-four pounds.

John L. Cooper, of Sheffield, about as near Connecticut as the last crop to Vermont, exhibited a piece of some fifteen acres, no manure ever on the lot. Seed soaked in boiling water, one pint of soft soap to half a bushel of seed, (the crop did not soft soap the owner,) rolled in plaster and planted the 20th of May. It was a heavy crop of very good corn. The committee regretted in this crop, as in several others, the want of a few more spoons.

J. H. Rowley, of Egremont, presented some twenty-five acres of good corn on hill lands inaccessible to the manure cart.

Ten of the fields of corn examined gave sixty pounds or more to the rod, and but six of all the entries fell below fifty pounds.

STEPHEN REED, *Chairman.*

HOUSATONIC.

From the Report of the Committee.

We have measured and weighed accurately every man's corn. In our decision we have been governed principally by the weight, eighty pounds of ears we call a bushel, which is the standard, as adopted by the State Board of Agriculture.

The first premium for the best acre of corn we give to Henry D. Palmer, of Stockbridge. Statement: Mowed last year, ploughed this spring, thirty-three hills on the rod, manured in the hill, planted 19th of May, soil gravelly loam, yield 138½ bushels to the acre.

The second premium for the second best acre we award to Henry Smith, of Lee. Statement: Meadow last year, manure spread on and ploughed in this spring, thirty-nine hills on the rod, ashes and plaster equal quantities, a handful put in the hill, planted about the 12th of May, soil sandy loam, yield 123 bushels to the acre.

The third premium for the third best acre we give to Emmons Arnold, of New Marlborough. Mr Arnold's statement we have not: twenty-eight hills on the rod, yield 117 bushels on the acre.

The fourth premium for the fourth best acre we award to Lebbeus M. Pixley, of Great Barrington. Statement: Mowed last year, ploughed last fall, manure spread on and ploughed in, and manured in the hill, twenty-eight hills on the rod, planted 15th of May, soil loam, yield 112½ bushels to the acre.

The fifth premium we award to Joseph Wilcox, of Sheffield. Statement: Pasture last year, manure spread on and ploughed in this spring, a handful of ashes, plaster and hen manure in the hill, thirty-two hills on the rod, planted 20th and 21st May, soil sandy loam, yield 106½ bushels on the acre.

The sixth premium we give to Eliada Peck, of Sheffield. Statement: Clover pasture last year, ploughed this spring, manured in the hill, seed put in scalding water, rolled in soft soap and then plaster, planted 21st and 22d May, twenty-five hills on the rod, soil loam, yield 103½ bushels to the acre.

To Hugo Dewey, of Alford, for the best piece of four acres of corn we award an extra premium. Statement: Pasture last

year, ploughed and manure spread on the furrow, ashes and plaster in the hill, planted 17th May, thirty-seven hills on the rod, soil gravelly loam, yield 112 bushels to the acre.

To Orrin Curtis, of Great Barrington, for the second best piece of four acres of corn, we award an extra premium. Statement: Corn last year, ploughed deep and manured in the hill from the distillery, planted the first week in May, ripe and harvested the 10th of September, forty-eight hills on the rod, Tillotson corn, soil dark loam, some clay and muck, yield 105 bushels on the acre.

S. H. Bushnell, *Chairman.*

NORFOLK.

From the Report of the Committee.

The subjoined papers are submitted with much satisfaction, affording, as they do, gratifying evidence not only of the increasing interest and skill of the farmers of Norfolk County in the cultivation of grain, but also of the feasibility of our soils for this purpose, and of the large profits resulting from these experiments.

J. P. Jones, *Chairman.*

Statement of Luther Gilbert.

The field of corn entered by me for premium, contains two acres; the soil is a black loam generally, and part of it mixture of gravel. The condition of the field was poor; it was sowed down to grass in the fall of 1846, without any manure; it has been in grass ever since, until September, 1852, when I had it broke up about ten inches deep. The manure used on this field was a compost made entirely, between the 18th of November, 1852, and the last of April, 1853, from one horse, one cow, and sods taken from the above field and composted in my barn cellar by my hogs. As the bulk of the manure was taken from the same field to which it was returned, I shall only estimate the value of the horse and cow manure, the use of the hogs for composting, and the carting the sods into the cellar, as that was the only cost to me. The compost was carted

directly from the barn cellar,—without turning over,—about the last of April, and spread as even over the whole field as it could well be, and immediately ploughed in. The quantity spread in this way, was about sixteen cords to the field,—or eight cords to the acre;—it was then harrowed and furrowed both ways, three feet four inches one way, three feet the other. There were about two cords of scrapings of the cellar put in the hill; on such parts of the field as the soil was poorest, one shovelful in the hill. On the 10th and 11th of May, I planted it with the Plymouth County corn, putting six to eight kernels to each hill; cultivated and hoed it twice, taking out all but five, and sometimes four, stalks at hoeing time.

On the 18th of October, the society's committee, after examining the whole field, selected two places, in separate parts of the field, and measured one square rod in each, which the committee considered to be a fair average of the whole. They measured from the centre between two rows, and gathered, shelled, and weighed each rod separately: the first rod weighed $44\frac{1}{4}$ pounds; the second, $46\frac{1}{4}$ pounds; making the average, $45\frac{1}{4}$ pounds to the rod; reckoning 56 pounds to the bushel, as per rule of the society, and it gives me $129\frac{1}{56}$ bushels to the acre. The corn was well ripened, and I commenced on the same day to harvest it.

Debt and credit on the above field:—

Land valued by the assessors at $225 per acre, interest on ditto,	$27	00
Taxes on the same, this year,	2	56
Ploughing in September, 1852,	5	00
Carting sods into barn cellar for hogs, at sundry times,	10	00
Manure of horse and cow, $5\frac{1}{2}$ months,	8	00
Use of hogs to work over sods and composting,	10	00
Applying manure, $10; ploughing, harrowing, and furrowing, $6,	16	00
Seed corn and planting, $3.50; cultivating and hoeing, $6,	9	50
Cutting stalks and harvesting,	16	00
		$104 06

Value of crop:—

Stalks and husks, ...	$30 00	
258$\frac{4}{7}$ bushels shelled corn, at 90 cents, .	232 20	
Increased value of land, benefited by manure,	14 00	
		$276 20
		$172 14

GRANTVILLE, NEEDHAM, Nov. 11, 1853.

Statement of J. R. Dow.

The one and five-eighths acres of land which I offer for premium, were broken up and planted to corn in 1852, and then manured with five cords of piggery manure to the acre. In 1853, the same land was treated in precisely the same way. I finished planting 8th of June, as follows:—

25 rows were planted 18 inches apart both ways.
50 " " 24 " " "
50 " " 30 " " "

And the result was as follows:—

336 baskets of sound merchantable corn.
20 " " very good pig corn.

356 baskets.

Equal to one hundred and nine bushels shelled corn to the acre. Twenty baskets were shelled and weighed, which yielded ten bushels, or five bags, each weighing one hundred and eleven and three-quarter pounds to the bag. The corn planted twenty-four inches apart yielded the best. After having tried the experiment of close planting, I have come to the conclusion to plant in future twenty-four inches apart, feeling satisfied I have the best crop and the largest yield when my land is manured as above. The land is a moist, loamy soil, originally very rocky.

Estimated cost and expenses:—

Piggery manure, ...	$48 75
Ploughing, harrowing and spreading manure,	15 00
Furrowing and planting, ...	8 00
Cultivating and hoeing, ...	6 00

Cutting stalks and harvesting, . . .	$14 00	
Taxes, ...	90	
Interest on the value of the land, at $150 per acre, at 6 per cent., is	10 71	
		$103 36

Value of the crop:—

356 baskets, or 178 bushels, at $1 per bushel,	$178 00	
Stalks and husks, ...	35 00	
		213 00
Profit, ...		$109 64

Or at the rate of $67.45 per acre.

Annexed is a certificate of the land, as surveyed by Charles Breck, Esq., Surveyor.

Milton, November 10, 1853.

Milton, November 3, 1853.

This certifies that I have measured the piece of land on which the corn of Mr. J. R. Dow grew, and found it to contain one acre, two roods, twenty rods.

Charles Breck, *Surveyor.*

P. Ruggles' Statement.

The land on which the corn was raised was planted in 1852, one-third with corn and two-thirds with potatoes, and was manured about the same as the present year. The soil is a good loam, and has been cultivated many years. This spring it was ploughed with a horse, after spreading about three-fifths of the manure, the other two-fifths being put in the drills on which the corn was planted, one kernel in a place on each side of the drill, in a zig-zag form, about six inches apart. The drills were from two and a half to three feet apart. The suckers, of which there were a great many, were cut soon after the corn was silked out, in order to let in the sun, the drills running nearly north and south. I supposed, in the spring, that I had planted one acre, but, by actual measurement, there was but one hundred and thirty-three rods. The produce was one hundred and

forty-seven baskets of ears, yielding, by estimated measure ninety-seven bushels and nineteen quarts, or about one hundred and eighteen bushels per acre. The corn was planted about the 15th of May, and was of the kind called Plymouth County, or smutty white. One-third of the field was moist land, and yielded much better than the other part.

Estimated cost of said crop:—

Five cords barnyard manure, at $6 per cord,	$30 00	
Carting out and spreading,	3 00	
Ploughing the ground twice with horse,	3 50	
Two days' planting,	3 00	
Ploughing and hoeing twice, four days,	6 00	
Cutting suckers, two days,	3 00	
" stalks, " "	3 00	
" up but stalks,	2 50	
Husking corn, 4 days,	5 00	
Interest on land, at $200 per acre,	10 50	
Taxes, about	1 00	
Value of seed,	75	
		$71 25

Value of the crop:—

97 bushels and 19 quarts corn, at $1 per bushel,	$97 59	
Suckers and top stalks, 2 tons,	20 00	
Buts and husks, 2 tons,	10 00	
		127 59
Net profit on 133 rods,		$56 34

Milton, November 10, 1853.

This certifies that I measured the land on which the corn of Mr. P. Ruggles grew, and found that it contained 133 rods.

Charles Breck, *Surveyor.*

Milton, October 27, 1853.

Report of Special Committee on Mr. Ruggles' Crop of Corn.

The committee appointed at a meeting of the trustees of the Norfolk Agricultural Society, on the 17th of November last, report: That, in pursuance of that appointment, they have visited the farm cultivated by Mr. Philemon Ruggles, in Milton,

for the purpose of ascertaining the accuracy of the statement made by him respecting his crop of corn.

The field measures 133 rods, from which 147 baskets of corn, on the ear, were gathered, measuring, when shelled, $20\frac{1}{10}$ quarts per basket, and weighing 37 lbs., making 5,439 lbs., which, divided by 56 lbs., the society's standard for the bushel, gives 97 bushels, equal to 117 bushels to the acre.

As a part of this corn had already been removed, the committee could not strictly verify Mr. Ruggles' account of the number of baskets brought from the field. They have, however, no reason to doubt its accuracy; and it is substantially corroborated by Mr. Breck's admeasurement of the bin soon after the corn was placed there.

THOMAS MOTLEY.
CHEEVER NEWHALL.

December 8, 1853.

MILTON, November 12, 1853.

To J. P. Jones, Esq., Chairman, &c.

Inclosed you will receive the statement of B. F. Dudley, on rye, and those of J. R. Dow and P. Ruggles, on corn, and as you requested me, being in the neighborhood, to examine them, and communicate what information I could obtain respecting them, I submit the following:—The land on which Mr. Dudley's rye was raised, as he states, was called worn-out plain, and fifty dollars per acre would have been called a high price for it for cultivation. It has been mostly used for pasture for many years, although sometimes cultivated, but never, to my knowledge, with much success until the present year. As you will perceive by his statement, it was not a selected part of his field that was taken to estimate from, but the whole taken together; and, as I often examined the field, I think it would have been difficult to have selected one acre better than the rest, as it was very even, and all good. After the grain was harvested, and the quantity reported, I measured the ground, and found it to contain two acres, three roods, seven rods, as given in his statement, which, as I reckoned it, is at the rate of $47\frac{1}{2}$ bushels per acre. The rye, after reaping, was stooked in the field for some time, and then carted near to the barn and stacked out for some weeks, then taken into the barn and threshed, and

must have lost several bushels in moving, which would have been saved had it been carried directly from the field into the barn, and have made the crop near or quite fifty bushels per acre, making a clear gain of about $48 per acre—a sum sufficient to have bought the land a few years ago, and which, in many parts of the county, would now buy land equally as good, and in some much better.

Mr. Ruggles supposed, at the time of planting in the spring, that he had an acre of land, and entered it for a premium accordingly. Subsequent measure, however, proved that there was but one hundred and thirty-three rods. I visited the field several times, and, as the land was strong and well manured, the corn grew rapidly and threw up a large quantity of suckers, which, as he states, were cut to let in the sun, of which there was some need, as the field was a perfect swamp. The practice of cutting the suckers is objected to by some cultivators, as injurious to the crop. In this case the suckers and top stalks were both cut, whether to its injury or benefit is not known; one thing, however, is certain, there was an extraordinary large crop. The field, by measurement, contained one hundred and thirty-three rods, from which there were harvested one hundred and forty-seven baskets of corn on the ear. On the 27th of October, I went to Mr. Ruggles' place, and helped him shell two baskets of ears of the corn, and found it to yield forty-two and one-half quarts of shelled corn, or ninety-seven nineteen thirty-seconds bushels on the one hundred and thirty-three rods. As there has been dispute about so large a crop of corn being raised in our county, I have been very particular about the measure, although I had no doubt of Mr. Ruggles' honesty in the statement, yet, to satisfy myself as well as the public, I measured the corn, which was put up in a regular bin, and found that there were two hundred and twenty-six cubic feet of ears, which—according to my figuring, and allowing 2,747.70 cubic inches to the heaped bushel, which, I believe, is the standard, being five hundred and ninety-seven and twenty-eight hundredths inches more than a level bushel—would give one hundred and forty-two baskets of ears; and, as it would pack much closer in a large bin than baskets, I think there could have been no mistake about the measure or quantity. I should

have stated that the cobs from the two baskets of ears weighed but fifteen and one-half pounds. The great superiority of this kind of corn consists in the extra quantity which a basket of ears will yield, being in this case twenty-one and one-quarter quarts; and, should it prove to contain as much nutriment as the yellow kind, it will be a valuable acquisition to the farmer.

The corn-field of Mr. Dow I also examined and surveyed, as my certificate will show. It was indeed an uncommon field to look at; and the result proved that it was equal to the promise. The soil was naturally rather moist, and originally very rocky, and many rocks are now in the land, large enough to occupy the space of several hills each, although no deduction was made on account of them in the measure of the land. This field also was surveyed after the corn was harvested, and the result reported to me; the produce of the whole field is also given, instead of taking one rod and measuring that, as has sometimes been done, giving an opportunity to say, that the best rod of the field was selected for trial. This field, as you will perceive, produced more baskets of ears to the acre than Mr. Ruggles' field; and had it yielded as much to the basket as that, would have produced over thirty bushels more to the acre; and, as there appears no reason why an ear of corn with a small cob may not be raised as easily as one with a large one, if the corn should prove as valuable, the difference in the yield would pay nearly the cost of cultivation—an object certainly worth the consideration of farmers. Respectfully yours,

CHARLES BRECK.

Thomas Motley, Jr.'s, Statement.

The following statement by Thomas Motley, Jr., Esq., of West Roxbury, shows that another remarkable crop of corn has been raised this year in Norfolk County:—

Quantity of corn produced from 3 $\frac{615}{1000}$ acres of land, in West Roxbury, year 1853:—

514 baskets, by average of 20 baskets shelled and measured, gives, by sealed measure, of good mealing corn, ...	85 bushels.
Pig corn, ...	10 "
	95 " per acre.

514 baskets, by weight 56 lbs. to bushel,
good mealing corn, ... 95 bushels.
Pig corn, ... 13 "

108 " per acre.

The land was surveyed November 28, 1853, by W. A. Garbett, land surveyor.

Statement of Isaac H. Meserve, Superintendent Roxbury Almshouse.

The acre of corn which I offer for a premium, was raised on light, loamy soil; it was pasture land in 1852; I ploughed it the last of September of that year, eight inches deep; last spring I spread about six cords of green barn manure, night soil, and meadow mud, well mixed: then ploughed from ten to twelve inches deep, harrowed it, then ploughed four inches deep, harrowed again, and planted with one shovelful of compost of hog manure and meadow mud in each hill; the rows three feet apart and the hills two and a half; the corn was the twelve-rowed kind, with four kernels in a hill. I planted the 17th of May; cut the stalks the 8th of September; and harvested the 19th of October. I cultivated once and hoed three times; after the first hoeing, I put around the corn two hundred and fifty pounds of guano.

Expenses:—		
Ten cords manure, at $4,	$40 00	
Ploughing and harrowing,	8 00	
Furrowing and planting,	5 00	
Hoeing, &c.,	5 00	
Cutting stalks, and harvesting,	7 00	
Interest on land,	6 00	
Guano,	7 50	
		$78 50
Value of crop:—		
Stalks,	$15 00	
One hundred and five bushels corn,	105 00	
One half the manure unexpended,	23 75	
		143 75
Leaves net profit of		$65 25

The ground was measured by James Ritchie, Esq.; the corn was measured by Mr. James M. Wentworth; there were one hundred and five baskets; one basket he shelled, and it measured thirty-two quarts. The most of the work was done by the inmates belonging to the institution; but I have charged for their labor, what I think it would cost.

I hereby certify, that on the 19th of October past, I harvested and measured one acre of corn, raised on Brook Farm this year: it produced one hundred and five baskets; I shelled one basket, and it measured thirty-two quarts, making one hundred and five bushels of shelled corn.

JAMES M. WENTWORTH.

BROOK FARM, November 12, 1853.

I hereby certify that I have, this day, measured one acre of land, on which corn was this season raised, for I. H. Meserve, Esq., at Brook Farm.

JAMES RITCHIE, *Surveyor.*

WEST ROXBURY, October 19, 1853.

Statement of Benjamin N. Sawin.

The two acres of corn entered by me for premium were raised on land of a sandy loam, and have been improved as a pasture the last eighteen years, without any cultivation. In May, 1852, the land was ploughed six inches deep, and harrowed, and planted with corn. I put upon the two acres nine cords of unfermented manure from my barn cellar. In applying the manure, (for an experiment,) on one acre, I spread four and a half cords and harrowed it in, put none in the hill; on the next acre I applied the same quantity and quality of manure in the hill, and spread none. In May, 1853, I ploughed the ground eight inches deep. On one acre, (the same that was spread on last year,) I spread and ploughed in four and a half cords of unfermented manure, put none in the hill, and furrowed with a horse-plough, making the hills two feet ten inches apart each way; on the next acre I applied the same quantity and quality of manure in hill, and spread none. The corn was planted the 20th and 21st days of May, putting four or five kernels in the

hill; a cultivator was used between the rows, and hoed twice; harvested the 20th of October. Two rods (one on each acre) were selected, which were considered a fair sample of the field. On the acre on which the manure was spread, the rod yielded nineteen quarts shelled corn, which weighed thirty-five pounds, and allowing fifty-six pounds to the bushel, made one hundred bushels per acre. On the acre on which the manure was put in the hill, the rod yielded seventeen quarts of shelled corn, which weighed thirty-one and one-quarter pounds, which makes eighty-nine and two-sevenths bushels per acre. The expense of the crop was as follows, viz.:—

Interest on value of land, at $45 per acre,	$5 40	
Taxes,	54	
9 cords of manure, at $5 per cord,	45 00	
Ploughing, twice,	5 50	
Furrowing,	1 50	
Carting and applying manure,	4 50	
Planting,	4 25	
15 quarts of seed,	47	
Crow line around the field,	16	
Cultivating and hoeing, twice,	6 25	
Cutting and binding stalks,	2 55	
Harvesting corn,	10 00	
		$86 12

The value of the crop is as follows:—

Stalks,	$6 96	
Husks,	13 00	
One-half of manure unspent,	22 50	
189$\frac{2}{7}$ bushels of corn, at $1,	189 28	
		231 74
		$145 62

Dover, November 9, 1853.

Statement of R. Mansfield.

The field planted with corn, measures four acres and sixty-eight rods; the soil is free and easy to work, without a single stone upon it; it has been used as a field for growing redtop seed, for a number of years previous to 1850; since that, it

has been pastured by milch cows, till the present year; no manure had been put upon it; the cows had been yarded off the land at night, thus reducing the land by continued cropping. Last spring the land was ploughed with Keith's plough, No. 1, cutting a furrow about ten inches in width, not over seven in depth; the team was two horses; it was harrowed lightly with one horse, then furrowed both ways, so as to make about three thousand hills to the acre. The manure used, was a mixture of mud, with the barn and pigsty manure, through the year remaining in the yards till it was put directly in the hill. The corn was an eight-rowed variety of yellow, and had been raised for more than forty years in this vicinity. The seed was prepared by a method which I have practised nearly forty years, which prevented the ravages of worms,* so that the hills were full of stalks, with but a very few exceptions. The manure being all put in the hills, the planting was immediately done, so there was no loss by the sun and winds, as often happens; commenced planting corn the 18th May; owing to stormy weather, it was delayed till June 1st; commenced ploughing and hoeing 10th June; we ploughed and hoed the field over three times between this and 12th July. The stalks were cut the second week in September; cut, bound, and piked up the same day; in about twelve days they were taken to the barn. On the 7th of October commenced harvesting. The result is as follows:—

	Cr.	
By 600 bundles stalks, ...	$12 00	
8,550 pounds husks, ...	32 06	
190 bushels corn, ...	190 00	
		$234 06

	Dr.
Interest on land, ...	$15 00
Taxes, ...	1 20
Ploughing two and a half days with two horses, ...	10 00
Harrowing and furrowing, ...	5 00

* *A Receipt for preparing Seed Corn.*—Dissolve four table-spoonfuls of tar in one gallon of boiling water, and stir in immediately six quarts of corn; in two minutes drain off the water; then mix one pint of plaster of Paris, which will separate the kernels for dropping.

Seed corn, thirty-three quarts, . . .	$2 00	
Seventy-two loads manure, twenty-five bushels each, ...	72 00	
Planting, ...	21 60	
Ploughing and hoeing, first time, . .	7 50	
" " second time, . .	6 00	
" " third time, . .	4 50	
Cutting and curing stalks, ...	5 00	
Harvesting, ...	19 00	
		$168 80
		$65 26

The corn cost sixty-five cents and six mills per bushel. Now should we subtract one-half the expense of manure, as is the practice of those who contend for premiums, it would have cost but forty-six cents and seven mills per bushel. My object in this experiment is to prove that the largest crops are not always the most profitable.

West Needham, November, 1853.

PLYMOUTH.

Amasa Howard's Statement.

The acre of land on which I raised the crop of corn, entered by me for a premium, is a hard, slaty soil. It had been in grass for the last ten years, producing, with but one top-dressing in that time, annually, from one and a half to two tons of hay.

Last May I drew on the whole field, containing (according to a late survey) one acre, fifty-two rods and a fraction, and ploughed in, nine inches deep, forty-four loads of green manure; then thirty-four loads from my slaughter-house cellar, and harrowed it four times. From my compost heap I drew on seventeen loads, dropping it in the hills; planted 23d and 24th of May, three feet and about three or four inches one way, and eighteen inches the other, putting three kernels in a hill. The third week in June cultivated it, and the fourth week cultivated and hoed it. It was hoed again the last week in July. I did not cut the stalks till very ripe.

Expenses were as follows:—

Ninety-five loads of manure, at seventy-five cents,	$71 25
Carting and spreading the same,	18 20
Seed corn, bought of Calvin Leavitt,	50
Ploughing, harrowing and furrowing,	5 25
Dropping manure, and planting,	4 18
Cultivating,	1 25
Hoeing twice,	10 40
	$106 03
Deducting two-thirds manure not exhausted,	47 50
	$58 53

I consider the fodder to pay for harvesting and interest of land.

West Bridgewater, Mass.

Calvin Leavitt's Statement.

The acre of land that produced the crop of Indian corn entered by me for premium, has been mowed the two past years without any dressing. On the 17th and 18th of May last, I carted on thirty-two loads of stable manure, made the past winter. I spread the same; ploughed the 19th, and planted 20th and 21st, about three feet (little more) one way, eighteen inches the other; I put no manure in the hills. The corn planted was the smutty white, or Leonard Hill corn. I planted four kernels in each hill. I ran a cultivator between the rows three times during the season, and hoed twice, the last time, about the 20th of July. The 11th of October, the supervisor harvested two rods, considered an average; an estimate from which made one hundred and nine and fifty-five eighty-fifths bushels. Expenses:—

Nine loads manure,	$22 50
Carting, spreading manure and ploughing land,	8 00
Ploughing and planting,	6 50
Cultivating and hoeing, for the season,	7 00
Ten bushels of ashes, put on the hills at hoeing,	1 50
	$45 50

You will see by this statement that I have charged only one-half the worth of manure to the corn crop; as it was very dry the past season, I think that one-half the worth of the manure is left for future crops. I make no estimate for harvesting, as I think the fodder will amply pay for the same.

BRIDGEWATER, Mass.

Spencer Leonard, Jr's, Statement.

The acre of land on which was raised the crop of Indian corn entered by me for premium, is a light, sandy loam. It was greensward, and has been mowed three years. The last year it produced about half a ton of hay. Last May there were nine cords of good manure spread upon the grass, and ploughed in; then there were eighty bushels leached ashes spread, and upon one-third of it, one hundred pounds super-phosphate of lime were also spread, which, with the ashes, were well harrowed in. I did not perceive any effect whatever from the super-phosphate of lime. The corn was all planted the 21st day of May, without any manure in the hill. Upon a part of the piece ten bushels of unleached ashes and one bushel of plaster were applied on the top of the hills. The cultivator was passed through it six times, and it was hoed twice. The corn planted was smutty white; the seed was obtained by selecting the best ear from stalks which produced two or more ears. Expenses:—

Nine cords manure,	$36 00	
Carting and spreading same,	10 00	
Ninety bushels ashes and applying,	15 00	
Super-phosphate of lime, and applying,	3 00	
Plaster,	60	
Ploughing and harrowing,	3 75	
Planting,	2 00	
Cultivating, six times,	2 30	
Hoeing, twice,	5 00	
Cutting stalks,	2 50	
Harvesting,	7 00	
Interest on land and seed,	3 50	
		$90 65

Income:—		
Amount of corn as measured by the supervisor, one hundred and one and fifteen eighty-fifths bushels, at 90 cents, . .	$91 05	
Two and a half tons corn fodder, at $8, .	20 00	
Half the manure and ashes not exhausted by the corn crop, ...	30 50	
		$141 55
Net profit, ...		$50 90

Bridgewater, Mass.

Horace Collamore's Statement.

Having entered as a competitor for the premium offered by the Plymouth County Agricultural Society, "for the best field of Indian corn, not less than two acres," I will state that the soil is a sandy loam, was in corn the last year, prior to which it had laid in grass five or six years. About the first of May eighty loads (of forty cubic feet) of good compost manure were spread on the field and ploughed in with the double mould-board Michigan plough, (averaging nine inches in depth.) It was harrowed and planted with corn, without any manure in the hill, on the 17th and 18th days of May, three feet apart one way, by two feet the other. Just before weeding, twenty bushels of leached ashes were put around the corn; it was cultivated and hoed twice. The crop suffered very little from the drought of June and July, which I attribute to the extra depth of ploughing; but when the wet season commenced, it run up rapidly to a height never before attained, I presume, by the Whitman corn. This, I think, had a tendency to lessen the crop in proportion to the increase of the fodder.

It is contrary to my usual practice to plant a field to Indian corn two years in succession—a practice I would by no means recommend to others, for I am confident that, but for this cause, my crop would have been much larger.

In addition to the corn crop we have raised five loads of very fine pumpkins.

Expenses:—	
80 loads of manure,	$80 00
Carting and spreading manure,	10 00
Ploughing, harrowing, and furrowing,	7 00
Planting, and seed corn,	4 00
20 bushels ashes, and application,	4 00
Cultivating and hoeing,	5 00
Interest on land,	6 00
	$116 00
Deduct half the manure and ashes,	42 00
	$74 00

One hundred and seventy-nine and sixty-five eighty-fifths bushels of corn and five loads pumpkins cannot be worth much less than $200. The corn fodder always pays well for harvesting.

PEMBROKE, Mass.

Samuel W. Bates' Statement.

The three and three-fourths acres of land on which my corn was raised is a sandy loam, inclining to clay. It was ploughed the last of September, 1852, about seven inches deep; was mowed before ploughing; it yielded 700 lbs. of hay to the acre. About the first of May I carted from the barn sixteen loads of manure, made the past winter, and spread it on about one-third of the piece, and ploughed it in. I then drew thirty loads of compost manure from the hog-yard, of about thirty-six cubic feet to the load, and spread it on the furrow, and harrowed the whole piece twice. Then I spread on the whole piece 400 bushels leached ashes, and bushed it over and furrowed, about three feet three inches one way, and carted on twenty-eight loads of manure from the barnyard—which was very poor compost manure.

On two-thirds of the land I put two-thirds of the manure in the hills, and on the other third I spread the whole, without any in the hills. That without any in the hills I think the best. I dropped in the hills, twenty inches apart, the 11th and 12th of May, three kernels of the Whitman corn, mixed with a smaller

yellow corn. The next day after planting I dropped fifty-five bushels of dry ashes on to the hills; went through with the plough once, and cultivated twice; hoed twice.

Expenses:—

Ploughing,	$9 37
Cross ploughing,	2 50
Four hundred bushels ashes,	72 00
Cost of ashes and dropping,	10 17
Twenty-one cords manure,	63 00
Carting and spreading,	12 00
Harrowing,	1 50
Planting and furrowing,	6 75
Ploughing and cultivating,	3 00
Hoeing,	12 00
Seed corn,	1 50
	$193 79

Bridgewater, Mass.

Corn for Fodder.

From the Report of the Committee on Farms, in Norfolk County.

The cultivation of this highly nutritious, succulent food, was long ago recommended by one of the most eminent agriculturists in this part of our country, the Hon. Timothy Pickering, of Salem, first president of the Essex Agricultural Society. In this county, as in Essex, and elsewhere, it has been uniformly attended with the best results. Tracts of old pasture land, and of light, sandy soil, have been made to produce large crops of this choice feed for dairy cows, at a period when the grass on such land would have failed to furnish even a tolerable supply; while, at the same time, the soil has been placed in the most suitable condition for future tillage and other crops.

The experience of a farmer in this county, who has grown corn fodder for many years, has been an increase of succulent and nutritious feed sufficient to sustain double the number of cows formerly kept on the same land. His mode of cultivating it has been chiefly by the use of the plough. The ground being

in proper condition, is deeply furrowed with a large plough. These furrows are supplied with a heavy dressing of green manure, or of green and compost thoroughly mixed. Sweet corn, or a mixture of sweet and Northern field corn, is sown thickly upon them, and the soil is turned back to cover it, by the horse plough passing on each side of the furrow. This, with slight use of the hoe, will sufficiently cover and level the top of the drill, and one repetition of the ploughing and hoeing will finish the necessary labor on the growing crop. The sweet corn is found to produce a more succulent and tender stalk and leaf than the white Southern corn, which is usually planted. Cattle will eat it with avidity and entirely, while the coarse stalk of the other sort is often left untouched upon the field, or in the crib. The leaf is broader and draws more nourishment from the atmosphere, and the whole plant is less exhausting to the soil, and more grateful to the cattle. The superior effect of its use is also to be traced in the quality of the milk and the butter.

The extensive culture of this article, is therefore recommended, with the full belief that the benefit of it will be seen in the large increase of stock which can be well kept on the same number of acres, and in the general products and profits of our farms. We add, also, that the use of green corn fodder as the principal food, has been found amply sufficient to sustain and keep in good, thriving condition, store pigs, from its first growth until the autumn frosts are felt.

From a brief experience, we are disposed to recommend, with much confidence, the "Stowell," or "Evergreen Sweet Corn," as the most productive variety to be grown on our soil. From this corn, with no great labor or cost, from five to ten tons of the richest feed may be raised on any acre of ground which would have failed to yield, under the best cultivation, three, or even two, tons of hay, or in pasture, to have kept, in good condition, one cow. If cut early and dried in small bundles on the fence, or in stooks, after wilting in the sun, this plant affords excellent winter feed for all sorts of stock, and if chopped and steamed, mixed with meal or barley meal, for fattening cattle and swine.

WHEAT.

WORCESTER NORTH.

Joel Hayward's Statement.

Gentlemen, I offer for premium one acre of spring wheat, on which I raised thirty-two and a quarter bushels. The land was a deep loam, and was planted to corn last season, to which crop was applied thirty-three loads of manure. Last spring it was ploughed twice, and sowed April 20th with two bushels of Italian spring wheat; the last of May we applied two hundred pounds of plaster; harvested the 5th and 6th days of August.

Edward Smith's Statement

The field on which my wheat grew was planted with corn last year, with about twenty-five cart loads of manure to the acre. The expense of the present year's crop is as follows:—

Splitting the hills, myself and oxen,	$1 00
Ploughing, one and a half day,	3 00
Sowing and harrowing,	1 50
Harvesting,	2 00
Threshing and winnowing,	3 00
Seed, two and three-quarter bushels,	2 18
	$12 68

The above is the expense of one and a half acres.

The field was measured by Mr. Woodward. Mr. Whitney measured the grain when it was threshed, and pronounced it thirty-three bushels. Weight, sixty-six pounds per bushel.

HAMPSHIRE.

Statement of Washington Miller.

I offer for premium a crop of wheat raised on one acre, in Sunderland. From this acre I took a fine crop of potatoes last fall. The year previous the land was a piece of old meadow. I harrowed and manured in the hill, putting a small shovelful of compost and a handful of lime and ashes in each hill. About

the middle of September I ploughed and sowed a bushel and a half of pure seed wheat, selected from the largest heads in the bundles of my previous crops. In October I sowed three bushels of stone lime, which had been soaked in brine; and last spring I added eight bushels of oyster-shell lime that had been brine slacked. I reaped, about the 12th of July, thirty-three bushels and three pecks, weight measure.

Value of crop:—		
33¾ bushels, at $1.50,	$50 50	
Straw sold,	5 00	
		$55 50
Expenses:—		
Seed,	$2 25	
Ploughing and harrowing,	3 00	
Lime,	2 69	
Harvesting and threshing,	5 56	
Interest on land,	6 50	
		20 00
Net gain,		$35 50

SUNDERLAND, Mass.

Statement of N. & B. Smith.

The quantity of land on which our crop of wheat was raised was one acre and seven rods, in Sunderland. In 1851 manure was spread upon the land, and a crop of Indian corn taken off; grass seed was sowed at the third hoeing. In June, 1852, a crop of clover and herds-grass was cut, yielding about one and a half tons. We harrowed with a seed harrow, ploughed deep, and rolled before sowing wheat. The quantity of seed used was a bushel and twenty-two quarts. We sown and harrowed September 3d, 1852, and harvested July 12th and 13th, 1853. In the spring we applied five bushels of oyster-shell lime, slacked in the brine from a bushel of salt; also five bushels of ashes. This dressing appeared to increase the crop, and to strengthen the straw, so much that a very small part of it lodged.

Value of crop:—		
35¾ bushels wheat,	$53 62	
2,300 pounds of straw,	7 00	
		$60 62
Expenses:—		
Seed,	$2 58	
Ploughing, harrowing, rolling, and sowing,	3 75	
Harvesting and threshing,	7 00	
Lime, ashes, and salt—preparing and applying the same,	3 00	
Interest on land,	7 00	
		23 33
Net gain,		$37 29

HAMPDEN.

Amos M. Carlton's Statement.

The crop of wheat which I offer for premium, was grown on one and a half acres of land, for the use of which, with the manure furnished, I pay a rent of ten dollars per annum. The soil is a dark, heavy, sand loam, in part; the remainder is lighter from an increase of sand; it was planted the two previous years, year before last, with potatoes, without manure; last year, well manured, and planted with corn and potatoes; the produce, forty bushels of corn, and sixty-two of potatoes. Value of crop, sixty-one dollars. The crop was removed about the middle of September, and the land prepared for the present crop. Two bushels and a half of seed were used, with a light top-dressing of manure. The land was well harrowed and seeded with grass seed. The crop of wheat was harvested in July, and the yield was fifty-two bushels of wheat; equal to thirty-four and two-thirds bushels per acre. The expense of cultivation was as follows:—

For preparing the land, sowing and harrowing in seed	$5 00
Seed,	3 75
Harvesting,	7 50

Threshing, ...	$7 00	
Land rent, ...	10 00	
		$33 25
Value of 52 bushels wheat, at $1.50, . .	$78 00	
" straw, ...	10 00	
		88 00
Balance in favor of the crop, ...		$54 75

Actual cost of raising the crop, sixty-four cents per bushel.

I will also present you with a statement of what may be considered by those looking for great results, rather unimportant intelligence. Yet, in comparison with the actual profits of the crop, as by the table furnished in the society's report for 1851, from several of the greatest wheat growing States, it will be noticed that this accidental crop, if the term be admissable, gave a larger actual return of profits than the average results from those States.

The acre of ground upon which the crop of wheat was raised in 1852, and for which I was awarded the society's premium, was soon after harvest, prepared for a crop of turnips, by ploughing under the stubble, and harrowing in a top-dressing of fine manure, and then sowed with turnip seed. These were soon up and presented a promising appearance; but soon the wheat, which was unavoidably scattered in harvesting the crop, began to show itself, and claiming precedence of right, very soon overspread the ground, and so shaded the turnips that a very small crop of them was obtained. Last spring, the wheat (thus buried) looked so promising, I was induced to stimulate its growth by applying a top-dressing of two hundred pounds of plaster mixed with two barrels of ashes, and await the result. It was harvested in July. The yield was twenty-two bushels of clean grain, weighing sixty pounds per bushel. The avails of this crop follow:—

22 bushels of wheat, at $1.50, . . .	$33 00	
Straw, ...	5 00	
		$38 00
Cost of plaster and ashes, ...	$2 00	
" harvest and threshing, . . .	5 00	

Cost of land rent, ...	$10 00	
		$17 00
Balance in favor of crop, ...		$21 00

Cost per bushel, seventy-nine cents.

I consider the turnips paid the expense of ploughing the land, and the manure used, and I have not included them in the account.

BERKSHIRE.

From the Report of the Committee.

Mr. Baldwin, of Egremont, had two acres of blue stem (winter) wheat, sown on pasture land, ploughed six inches deep, 1st of July, subsequently ploughed three times and harrowed three; two and a half bushels seed to the acre, soaked twelve hours in brine, then rolled in lime. Sowed 10th of September. No manure.

Mr. Curtis, of Great Barrington, had four acres, sown on oat stubble, light plain land, ploughed once—twelve loads coarse manure harrowed in. Two bushels blue stem sown to the acre, without any preparation, September 6. An acre of this wheat was threshed, and yielded 2,554 pounds of most beautiful wheat.

Mr. Laird, of Great Barrington, had five acres, directly south of the Van Deusenville Furnace. Ground well sprinkled with quartz boulders. We saw this in the swarth, but it appeared to us very heavy. It was threshed and sold for seed, and is reported to have fallen but a few pounds short of forty bushels to the acre.

It was the blue stem, sown with fourteen loads manure to the acre, 1st of September. Seed soaked in brine.

The blue stem wheat was brought to this county four years ago, by O. Curtiss, of Sheffield, and has proved very valuable. We examined very fine wheat belonging to Mr. E. Kellogg, of Sheffield; Nelson Joyner, of Egremont; Enos Smith, of Stockbridge; R. Mills, and D. A. Bulkley of Williamstown, and S. Powell of Lanesborough.

Mr. Coman, of Pittsfield, showed us very heavy wheat on ground which received last year, twenty-eight loads of muck and turf, which had been one year in the hog-pen, and gave about sixty-five bushels of corn to the acre.

This season, it was ploughed and harrowed once, and the seed ploughed in. Two and one-eighth bushels of seed, soaked in strong brine and rolled in lime. No manure or other fertilizer.

The wheat of Mr. Richards, of Lenox, was on corn ground, which received, last year, sixteen loads of manure to the acre, and gave eighty bushels of corn. This season no manure was used. Wheat sown the 1st of May, two bushels per acre, ploughed twice.

The wheat of Mr. Lawton, of Great Barrington, was sown after turnips, two and one-half bushels Mediterranean wheat, the 25th of April.

Mr. Cook, of Richmond, showed us two pieces—one of Black Sea and the other Mediterranean, both after corn. The ground was old meadow, ploughed seven inches, and well manured, and gave a good crop of corn. It had no manure this year. Ploughed once, seven or eight inches.

HOUSATONIC.

From the Report of the Committee.

Never were such fields of beautiful wheat seen in Southern Berkshire, showing conclusively that the time has come, when we can raise this grain in sufficient quantities for home consumption, and of as good quality as can be grown in any country.

Statement of Ira Curtiss, of Sheffield.

Winter Wheat.—This piece of wheat contained four acres, very heavy and even; oat stubble, ploughed once, and sown the 6th of September—two bushels to the acre; twelve loads coarse manure spread on the furrow to the acre, no preparation of seed, soil sandy loam.

This wheat is known as the "Blue Stem Wheat," and was

introduced into this county four years since from Western New York, by Orrin Curtiss, of Sheffield, and is the kind that is now generally raised, and is probably the best for our soil and climate. Mr. Curtiss has measured and threshed very carefully one acre of his wheat, from which he had forty-two bushels and thirty-four pounds, of sixty pounds to the bushel, of most beautiful wheat.

Statement of Mark Laird.

Winter Wheat.—The piece contains five acres blue stem wheat, on oat stubble, fourteen loads of manure spread on to the acre, and ploughed in; sown 1st September, seed soaked in brine, and rolled in lime; soil, loam; measured and threshed one acre, and had thirty-nine bushels and eight and a half pounds, sixty pounds to the bushel.

Statement of Elisha Kellogg.

Winter Wheat.—Blue stem wheat, one acre, on pasture, ploughed once, and sown immediately, first week in September, with two bushels of seed; no manure, soil, sandy loam; had thirty-eight bushels and nine quarts on the acre.

Spring Wheat.—This crop will not compare with winter wheat, either in quantity or quality. It is, however, a good crop on some soils, and in some sections of our county where winter wheat cannot be successfully grown. It does best in a moist strong soil.

The first premium on spring wheat, we award to Charles Hinckley, of Lee. This piece of wheat was sown after corn, about the 10th of April, two bushels seed to the acre; soil, clayey loam.

The second premium on the second best acre of spring wheat, we give to Zacheus Candee, of Sheffield. Tea spring wheat, sown after corn, about the middle of April; two bushels seed to the acre; soil, loam.

The third premium on spring wheat, we award to J. R. Lawton, Jr., of Great Barrington. This wheat was sown the 25th of April, after turnips, two and a half bushels of seed to the acre; soil, clayey loam.

We award a gratuity to Joseph Kline, of Egremont, for a piece of excellent spring wheat of a new variety, which he has been to some expense and trouble to introduce here, and which bids fair to be valuable, called the "Bald Club Wheat."

NORFOLK.

Statement of Horatio Mason.

The field of wheat entered by me for premium, contains one acre and forty rods; the soil gravel, and subject to drought; it has formerly been ploughed lightly. Last year I ploughed it full two inches deeper, (about eight inches,) and spread the dry parts with clay, at the rate of twenty loads per acre; planted with corn; manured in the hill with twelve loads compost—one-third mud, one-third clay, the remainder barnyard manure—and received a good crop. After the corn was removed, I again spread the dry parts with clay. In April of this year, I ploughed in the clay, and spread the whole field with twelve loads green manure, and ploughed it in; then sowed it with spring wheat, and harrowed in; the produce was one thousand three hundred and eighty pounds. I have not, in the account, charged for the clay. I consider that a large share of it remains for the benefit of future crops.

I charge for the

Two ploughings, ...	$3 00	
Sowing and harrowing, ...	1 50	
One-half twelve loads manure, . . .	6 00	
Reaping, binding, say $4; threshing, $4, .	8 00	
Two bushels seed, at $1.50, . . .	3 00	
Interest on land, worth say $50 per acre; taxes,	4 20	
	——	$25 70
Cr.—By twenty-three bushels wheat, at $1.50, . .		$34 50

East Medway, November, 1853.

PLYMOUTH.

Statement of Joseph Kingman.

The land on which I raised my winter wheat is rather high ground and what may be called a sandy loam, about half of which had been planted two years; first to corn, and then to early potatoes. The wheat was sown after harvesting the potatoes, about the 15th of September; the other part was sward land, planted to corn last year, and the wheat sown immediately after taking the corn off, the very last of September. The kind sown was the white flint, about five pecks to the acre. The land, when planted, was pretty well manured, but not heavily, say about fifteen ox-cart loads to the acre. No manure used on the wheat, except a load or two from the sink, and twenty bushels of leached ashes put on the poorest part. The wheat came up well, and spread so as nearly to cover the ground before winter. There was but very little killed by the winter. It grew luxuriantly and produced a large crop of straw. The wheat, I think, suffered a little from the drought in July, but notwithstanding, I had twenty-five and a half bushels of as fine wheat as I ever saw from three-fourths of an acre and fourteen rods.

West Bridgewater.

BARNSTABLE.

Statement of J. H. Knowles.

The wheat I offer for a premium was raised on half an acre of land. Manured at the rate of fifty loads to the acre, of barnyard manure; ploughed about ten inches deep, and planted with corn. The wheat sown about the 15th of September, among the corn, and hoed in. The value of the land was about $80 per acre. The produce was eight bushels on the half acre. Five pecks of seed were sown to the acre.

	Dr.	
Two and one-half pecks seed, . . .	$0 75	
Hoeing in, ...	75	
Harvesting, ...	1 00	
	——	$2 50

	Cr.
Eight bushels, at $1.25, ...	$10 00
Profits, ...	$7 50

EASTHAM.

RYE.

ESSEX.

Statement of William F. Porter.

I offer for premium a crop of winter rye, raised on one acre; the soil is of a sandy loam. In the summer of 1851 it yielded about one ton of hay per acre. In September following it was ploughed eight inches deep, and on the 15th, ten loads of compost manure to the acre were applied, thirty-five bushels to the load. One bushel of rye sown, covered with the harrow and rolled. On the 12th of July, 1852, it was harvested, and threshed out the last of August, and yielded twenty-eight and three-fourths bushels. On the 23d and 24th of September, 1852, the stubble was turned under, and ten loads of compost manure from the barn cellar, of about equal parts loam and cow manure, were applied, one bushel of rye sown, harrowed and rolled. On the 13th of July last it was cut with sickle and cradle, bound and carted into the barn the 16th, threshed out the 19th and 20th of August. The yield was thirty-four and five-eighths bushels, of fifty-eight pounds to the bushel. The weight of the straw was thirty-eight hundred and sixty pounds.

The expense of cultivating the said crop was as follows:—

For one man and one pair of oxen one day, ploughing, ...	$1 67
Carting and spreading ten loads of manure, the same, ...	1 67
Sowing, harrowing twice and rolling, one man and one pair of oxen one day, . .	1 67

Cradling, one man one day, . . .	$0 83	
Binding and carting into barn, one man one day, one pair of oxen half a day, . .	1 25	
Threshing, one man three days, . . .	2 50	
Carting the straw to Haverhill, one mile and a half, ...	1 50	
One bushel of rye sown, $1.12; ten loads of manure, $10, ...	11 12	
	——	22 21
Value of crop, thirty-four and five eighths bushels, sold at $1.12½ per bushel, . .	$38 95	
3,860 pounds of straw sold at fifty cents per hundred, ...	19 30	
	——	58 25
Net profit, ...		$36 04

Bradford, November 1, 1853.

WORCESTER WEST.

Statement of William A. Johnson.

I mowed off a crop of hay, 1st July, and ploughed it up. About the middle of August I harrowed and sowed on five pecks of seed and used no manure.

Expenses:—

First ploughing, ...	$3 00	
My boy and team getting in, one day, . .	1 00	
Reaping and getting in, three days, . .	4 00	
Threshing, (every eleventh bushel—four bushels, nearly,)	4 00	
	——	$12 00

Value of crop:—

Forty-two bushels rye, ...	$42 00	
Two tons straw, ...	12 00	
	——	54 00
		$42 00

We, the subscribers, certify that we threshed Mr. Johnson's

rye, and saw him measure it, and there were forty-two bushels clean rye.

HARRISON NEWTON.
WILLIAM WILSON.

The plan filed shows one acre and eighteen rods. The rye weighed, by Mr. Johnson, sixty and one-quarter pounds to the bushel.

E. WOODS, *Secretary.*

HAMPSHIRE.

Statement of George Dickinson.

The land on which this crop was raised contains three acres and thirty-six rods of second quality meadow land. In 1852 it was planted to corn, and manured at the rate of ten loads to the acre, spread on and harrowed in. After the corn had been cut and stacked the rye was sown, at the rate of one bushel and one peck to the acre. I harvested in July, threshed in August, and the yield was one hundred thirty bushels and eight quarts, averaging forty bushels and ten quarts per acre, at fifty-six pounds to the bushel.

Value of crop:—		
130$\frac{1}{4}$ bushels, at 80 cents, . . .	$104 20	
3$\frac{1}{7}$ tons straw, at $6, ...	18 86	
		$123 06
Expenses:—		
Interest on land, at $100 per acre, . .	$19 50	
Labor, ...	20 75	
Team, ...	8 00	
Four bushels seed, at 75 cents, . .	3 00	
		51 25
Net profit, ...		$71 81

HADLEY, November 24, 1853.

Statement of N. & B. Smith.

The land on which our rye was raised contains one acre seven and a half rods. A crop of wheat was taken off in 1852, yielding about twelve bushels per acre. No manure was applied

after the spring of 1851, and then it was put in the hill for broomcorn. The rye was sown on the 8th of September, at the rate of one bushel to the acre, and harvested on the 15th of July. The land was ploughed deep, and thoroughly harrowed.

Value of crop:—		
33½ bushels rye, at $1, ...	$33 50	
2,900 pounds of straw, at $6 per ton, .	8 70	
		$42 20
Expenses:—		
Seed, ...	$1 00	
Ploughing, harrowing, and sowing, . .	2 00	
Harvesting, ...	2 50	
Threshing, ...	2 00	
Interest on land, ...	6 00	
		13 50
Net profit, ...		$28 70

SUNDERLAND, October 22, 1853.

HOUSATONIC.

From the Report of the Committee.

Twenty-five pieces of rye were offered for our inspection. The winter, and the season also, has been very favorable for this crop. Of the twenty-five pieces, not one but would ordinarily be entitled to a premium. Such fields of rye your committee have no recollection of ever seeing.

Statement of Luther S. Butler.

The piece contains six acres, old pasture, ploughed once, and sowed 10th September, one and a half bushel seed to the acre, no manure used; soil, clayey loam; measured and threshed one acre; had forty bushels and four quarts.

Statement of Lorenzo H. Rice.

Oat stubble, ploughed once, and sowed the first week in September, one and a half bushel seed to the acre, no manure used; soil, gravelly loam, eight acres in the piece; had on one acre a fraction over forty-four bushels.

Statement of Nathaniel Cook.

The piece contains two acres, sown after wheat, the first week in September, one and a half bushel to the acre; twenty loads of manure put on the two acres; had gravelly soil; had thirty-nine bushels and nine quarts to the acre, weighing fifty-seven pounds to the bushel.

Statement of Joseph H. Chapin.

The piece contains four acres, sown after the spring wheat, 15th September, one and a half bushel seed to the acre; soil, sandy loam.

Statement of Robert B. Brown.

The piece contains twelve acres, old pasture, ploughed once, and sowed the first week in September; no manure; soil, gravelly loam.

NORFOLK.

Statement of B. F. Dudley.

The land on which this rye was raised, was used as a pasture until the fall of 1851, when it was ploughed with a Michigan plough. The following spring, it was planted with corn, potatoes, and barley. These crops were manured in the hill, with about four cords to the acre; the barley was manured at the same rate spread broadcast.

These crops were taken off, and on the 7th of October, 1852, the rye was sown.

The land from which this crop was taken, contains a fraction short of three acres.

Expense of the crop:—

Ploughing,	$10 00
6 cords pig manure, and carting,	36 00
20 bushels leached ashes and old plaster,	2 00
3¾ bushels rye, and sowing,	4 50
Harrowing, bushing, and rolling,	2 00

Reaping, binding, and stooking, . . .	$15 00	
Moving and stacking, ...	6 00	
Threshing and winnowing, ...	16 59	
		$92 09
Value of the crop:—		
132¾ bushels rye, at 90 cents, . . .	$119 52	
7 tons, 300 lbs. straw, at 75 cents per cwt., ...	107 25	
		226 77
		$134 68

The above crop is at the rate of forty-seven and a half bushels to the acre; and the land on which it was raised has always been called worn-out plain, and considered worth about $50 per acre.

Milton, September 26, 1853.

BARLEY.

BERKSHIRE.

From the Report of the Committee.

E. R. Colt, Pittsfield, and E. S. Rowley, of Richmond, showed us crops, which in some seasons, would have commanded something more than a badge of honor. It seems as yet, to be an open question whether the two or six-rowed barley gives the best returns. The six-rowed has shorter heads, and usually lighter kernels, but more in number. It appeared to us, as we saw them growing adjacent to each other, that the two-rowed would bear sowing some thicker than the other, and is not as liable to fall down before it is well filled. We saw splendid crops of both kinds.

NORFOLK.

Statement of Horatio Mason.

The field of barley contains one acre. It embraces a variety of soil, from a rich, gravel loam, on one side, to meadow mud on the other. It was planted with corn last year. This spring, the ground was ploughed, and spread with thirteen loads of green manure, and ploughed in, and sown with two bushels of four-rowed barley. The part of the field next to the upland is well adapted to this crop, and produced as fine a crop as I have ever seen, while the flat land next to the meadow was very light.

Expense of cultivating:—

Twice ploughing, $2.50; cultivating and sowing, $1, ...	$3 50	
Threshing and harvesting, ...	6 00	
One-half the manure, $6.50; interest on land, at $70.42 per acre, . . .	10 70	
Two bushels seed, $2; taxes, say 30 cents,	2 30	
		$22 50
Cr.—By 40 bushels barley, at 90 cents, . .		36 00
		$13 50

East Medway, November, 1853.

PLYMOUTH.

Statement of Spencer Leonard, Jr.

The land on which I made an experiment in raising barley, is a light sandy soil; it was planted to corn last year, and produced a good crop. This year, it was ploughed April 29th and May 3d; three bushels of barley were sown per acre, and on one-half of it, two hundred pounds super-phosphate of lime, and the other half, two hundred pounds of plaster, and all well harrowed in and rolled. There was no material difference in either half of the acre, at any stage of its growth, or in the grain adjoining, where nothing was applied. It was cut in

July, and in August it was threshed by hand, producing twenty-five bushels on one acre and seventeen rods.

Expenses:—

Super-phosphate of lime and plaster, . .	$6 00	
Three bushels barley, ...	2 25	
Ploughing, ...	1 50	
Sowing and harrowing, ...	1 75	
Cutting and getting in, ...	2 00	
Threshing and cleaning, ...	3 50	
Interest on land, ...	4 50	
		$21 50

Income:—

Twenty-five bushels barley, at 75 cents, .	$19 25	
One ton straw, ...	8 00	
		27 25
		$5 75

I think that the crop was injured from thirty to forty per cent., by the dry weather, which occurred at the most critical period of its growth.

OATS.

Statement of George W. Wood.

The acre of land I raised my oats on, is a clayey loam, and it is the same on which I raised my corn last year. I managed as follows:—

April 29th, ploughed; May 2d, sowed the oats, (three bushels and three pecks); the wind blowing, it took more oats than I expected, but I do not think it any loss.

After ploughing, I harrowed, then sowed the oats; went over with the cultivator, and harrowed again, till the soil was very fine; I then bush-harrowed it twice. I have found by experience, that working the soil is of great advantage for spring grain. I cut the oats the 25th of July, and threshed them

the 30th of September; they measured sixty bushels and one peck. The expense, I think, will not exceed twelve dollars.

Statement of Silvanus Hinkley.

The acre of land on which I raised the crop of oats entered by me for premium, is a gravelly loam; I have planted it with corn the two past years, spreading on about thirty loads of compost manure, each year. Last spring, I put on about fifteen loads of manure, one-half before ploughing, and the other half, after. I ploughed the last of March, and the 3d of April sowed four bushels of oats, and harrowed them in. The half acre I put the manure on after ploughing, I think was the best; the straw was much the largest. Harvested in August, and threshed and measured up fifty-nine bushels and three pecks.

BEANS.

NORFOLK.

Statement of Benjamin N. Sawin.

The half acre of white beans which I offer for premium was raised on soil of a light, sandy loam, which has been improved as a pasture for nineteen years, without any cultivation. In November, 1852, it was ploughed for the purpose of killing out the bushes, (consisting of white birch, sage willow, &c.;) the 1st of June last it was harrowed with a cultivator harrow across the furrows, and furrowed with a plough, one way, three feet apart; I then applied one and a half cords of unfermented manure, taken from the barn cellar, put half of a shovelful in the hill, eighteen inches apart in the row. The beans were planted the 10th of June; put from twelve to fifteen beans in a hill; they were hoed but once. They were harvested the 1st of October, and when threshed, measured eight bushels and four quarts. They weighed seventy pounds to the bushel. They were of the variety called the pea bean.

Expenses:—		
Interest on value of land, at $30 per acre,	$0 90	
Taxes,	09	
Harrowing,	64	
Furrowing and applying manure,	1 20	
Planting,	1 12	
One and a half cords of manure, at $4.50,	6 75	
Twelve and a half quarts seed,	75	
Cultivating and hoeing,	1 00	
Harvesting,	1 25	
		$13 70
Value of the crop:—		
Eight and one-eighth bushels of beans, at $2 per bushel,	$16 25	
Four hundred and fifty pounds stover, at thirty cents per hundred,	1 35	
One-half of manure unspent,	3 37	
		20 97
Leaves net profit of		$7 27

Dover, Nov. 9, 1853.

PLYMOUTH.

Statement of Abiel Bassett.

The half acre of land on which I raised the crop of white beans entered by me for premium, is a light, sandy soil. In 1851 I put on sixty bushels of leached ashes, and sowed it to winter rye. The first of last May I spread on nineteen cart-loads of stable manure, and ploughed it in; the ground was well harrowed; furrowed two feet between furrows, and planted in drills, with about three pecks of seed.

The beans were pulled and stacked in the field until they were dried; they were then threshed, and measured seventeen bushels and three pecks—making thirty-five and a half bushels to the acre.

BARNSTABLE.

Statement of R. Smith.

I have for three years been engaged in raising the marrow-fat bean, and have this year three acres in one lot. The land cost, last winter, $30 per acre, and had been lying fallow for twenty years. I carted fourteen horse-loads of manure to the poorest spots, and ploughed May 10th; harrowed thoroughly, and stirred it with cultivator twice before planting, which I did June 15th, with one bushel of seed to the acre. With a machine of my own construction, I planted two acres a day, with a boy and horse. It was planted in drills, two feet apart. When high enough to work, I used the cultivator between the rows, and my boy followed with a hoe. I then planted turnips between the rows. The beans were then left till harvest. The result is stated below:—

Estimated seventy-five bushels of beans, $2,	$150 00	
" one hundred bushels turnips, 30c., .	30 00	
		$180 00
Cost of preparing soil, seed, manure, cultivation and harvesting, ...		42 90
Profits, ...		$137 10

GRASS SEED.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of George Dickinson.

I have raised, the past season, three bushels and thirty-one quarts of herds-grass seed on two acres and sixty-nine rods of ground. A sample of the seed was exhibited at the late fair.

The land on which the seed grew is a clayey loam, with a very hard subsoil. It was ploughed in the spring of 1852 and

sown to oats; but, owing to the dry weather, produced only a light crop. In August the land was ploughed and subsoiled about a foot deep, and sown the fourth of September with one-half bushel of seed to the acre, and harrowed in. A part of the crop was mown the first week in August; the remainder stood a fortnight longer, and was then cradled and reaped. It was estimated that the part mown wasted nearly one-half the seed before it was threshed, it being dried thoroughly for hay.

The account with the crop stands as follows:—

	Dr.	
Grass seed,	$4 50	
Ploughing,	8 00	
Sowing and harrowing,	1 25	
Interest on the land at $40 per acre,	6 00	
Taxes,	1 00	
Cutting and threshing,	5 00	
		$25 75
	Cr.	
Three bushels, thirty-one quarts, at $3.50 per bushel,	$13 89	
One ton and a half of hay, at $8 per ton,	12 00	
		25 89
Net,		$0 14

The above statement I believe to be true and correct.

HADLEY.

ROOT CROPS.

An appropriate introduction to this section, is to be found in the Transactions of the Norfolk Society, of which the Committee on Essays (Hon. Marshall P. Wilder, chairman,) speak as follows:—

"The committee have examined this paper with much pleasure. It is a sensible, well-written production—practical

in character, useful in its tendency, and is evidently from the pen of one accustomed to present his views in a clear and perspicuous manner. This essay furnishes information and suggestions valuable to farmers, wherever located, and affords gratifying evidence that we have, among that worthy class of our fellow-citizens whose peculiar profession is to *cultivate the soul rather than the soil*, those who are qualified to discuss the most difficult topics, and give direction and encouragement to thinking men, and especially to those belonging to the great interest of agriculture.

"The committee consider this Essay on the Potato, written by Rev. JOHN M. MERRICK, of Walpole, as one of the best which has been presented to the society."

In the following remarks, I confine myself within a narrow range, and leave unsaid many things respecting the culture, gathering, preservation and uses of potatoes, which might perhaps have been interesting to the farmers of Norfolk County. I shall speak briefly of the history, uses, planting, and diseases of the potato, in the hope that this imperfect essay may provoke my fellow citizens to deeper investigations, to more numerous and intelligent experiments with reference to these subjects. Diligent inquiries and accurate experiments promise the only satisfactory results. The members of this society are earnestly requested to preserve their farm journals, that at some subsequent occasion we may compare notes, and from our united efforts, increase our knowledge and learn the best methods of applying it to practice.*

1. *History of the Potato.*—It is remarkable that the history of a plant which has exerted so great an influence upon the civilization of the world, should be involved in so much obscurity. It is difficult, if not impossible, to ascertain the time at which, or the nations by whom, it was transported from South America to distant regions. The Spaniards found it only in

* I have recently received a letter from an intelligent member of our society now in England. From diligent inquiries, in several agricultural counties, he learns that the potato rot prevails extensively this season; and that the potatoes not diseased are very few, small, and of inferior quality. Such facts here and there should furnish a motive to careful and continued experiments, if we would not abandon the cultivation of a plant so intimately connected with our agricultural prosperity.

Chili, though recently it has been said to grow wild in Peru, New Granada, and Mexico. Humboldt quotes De la Vega as saying, that in the times of the Incas, maize and potatoes, and in the warm regions, bananas constituted the basis of the nourishment of the Indians.* Clavigero says "the potato was brought into Mexico from South America, *its native home.*† The Abbe Molina asserts that it grew wild in almost every field.‡ Sir Walter Raleigh speaks of having seen potatoes in Guiana;§ but probably these were sweet potatoes, the climate of Guiana not being adapted to the Solanum Tuberosum. Darwin, in the "Voyage of a Naturalist," says: "The wild potato grows on these islands (the island of Chonos and others on the Pacific Coast of South America) in great abundance, near the beach. The tubers were generally small; but I found one that was two inches in diameter. When boiled they shrunk much, and were watery and insipid, without any bitter taste." There is no question that it was found wild in Chili, nor that from Chili it was carried to Southern Europe by the Spanish colonists.

But how it reached England is not so evident. The opinion has long prevailed that it was introduced from Virginia into England by Sir Walter Raleigh, in 1586. Even so discriminating a writer as Humboldt is deceived by the authority of Sir Joseph Banks, and others, and takes great pains to account for its existence in Virginia, aware that it was indigenous nowhere else in North America. It would be difficult to show that Raleigh ever was in Virginia. The colonizing expedition in which he was concerned reached Albemarle, some distance further south. There is reason to believe that the misunderstanding arose from a confusion of names. The early navigators, careless of botanical distinctions, may have applied the name of potato to the Solanum Tuberosum, and the Batatas Edulis or sweet potato, the latter alone being indigenous in the southern parts of North America. This was early carried to England, and cultivated. It is several times mentioned by Shakspeare and other writers.

There is some conflicting testimony on this point; for Gerard,

* New Spain, Volume ii. p. 370.
† History of Mexico, p. 27.
‡ Nat. History of Chili, p. 108.
§ Works, Volume ii. p. 194.

in his "Herbal," published in 1633, says: "I have received roots hereof from Virginia, (otherwise called Norembega,) which grow and prosper in my garden as in their own native country."* And by the drawing he distinguishes it from the sweet potato. Mattheolus, also, in his Commentary, speaks of it as having been first brought from Virginia to England; and adds that the Spaniards called it Pappas.† Something to the same purport is found in the "Universal History of Plants," published in 1651.‡ And a century earlier, Cicero says it was cultivated in Italy. After all, we cannot help thinking that the potato was probably brought to England from Spain or Italy. To these countries it has been introduced from the Spanish settlements in Chili, and had been cultivated there long before it was known in England. The commercial enterprise of Southern Europe, and the frequent intercourse of that part of the continent with England, would easily account for its appearance in the latter country.

The discoverers found tobacco, Indian corn and potatoes, growing at the places they visited. The only one of the three which impairs the value and shortens the duration of life, became the earliest favorite; while the potato, which has since furnished food to millions, was long neglected. Nearly fifty years after its introduction, the Royal Society began to notice it with a view to encourage its growth. Not that it had found its way to their tables unless as a luxury, steeped in wine or preserved in sugar, as the sweet potato was long before. Their thought was, that by adding another to the edible vegetables then in use, they might diminish the danger of famine, an evil of more frequent occurrence than now. The Royal Society considered it a desirable *last resort*, little anticipating that it would become a staple agricultural production. It is not mentioned in a review of the state of agriculture in the kingdom for 1685. Its culture was encouraged in Ireland, on the ground that it furnished cheap food to poor people, was easily raised, adapted itself to the climate, and was not fastidious as to soil.§

* Herbal, or Gen. Hist. of Plants, p. 927.

† Mat. Comm. p. 758. ‡ Vol. iii. p. 622.

§ The Gardener's Kalendar for 1708 says: "The root is very near the nature of the Jerusalem Artichoke, although not so good and wholesome; but it may prove good for swine.

In 1699, Evelyn said, "Plant potatoes in your poorest land," implying that they were undeserving of the best. It was not till the middle of the last century that the potato was generally known in England, and its cultivation was rather enforced by the partial failure of grain. In France, also, strong prejudices prevailed against its introduction as an article of food—prejudices that were overcome only by the perseverance of Parmentier, and the countenance of the king.

We must not suppose that the potato when first carried to Europe was the same thing that it now is, nor wonder that people mistook the seed-balls for the part to be eaten. There was some room for the opposition it encountered. Heriot says the roots were as large as walnuts, or a little larger; even if we suppose he meant English walnuts, the size of the potato would not be very formidable. Capt. Bowles, of the British navy, says, that in some parts of South America, "it is a common weed in the garden, but too bitter for use." Not many years ago wild potatoes from South America were cultivated in England and bore an abundant crop, the largest of which were of the size of a pigeon's egg, and disagreeably bitter, while the vines were seven feet long. Scarcely any vegetable has been more changed by cultivation, both in size and quality. We can form some idea of the change by recalling to mind what the long-red was forty or fifty years ago. Farmers raised it for hogs, and thought the hogs had a hard bargain, so poor and watery was it. Climate, soils, and improved methods of cultivation, have produced changes in the potato, as in many other vegetables. The rich plum of our gardens is the wild beach plum improved by culture. Celery, so mild and sweet, is produced from the coarse, rank smallage. The cherry, in its wild state, is small, hard and bitter. The potato has passed through this transforming process. From poor, watery and innutritious, it has been cultivated into a wholesome, pleasant-tasted and nourishing article of food; next to wheat, an article of the first importance to mankind. It combines the advantages of large yield, easy culture, adaptation to many varieties of soil, and a great amount of nutritive matter. From no other crop can so much food be obtained on an acre of land, with the same expense, except the tropical banana. In no other thing is the

influence of climate more evident, demonstrating that though man can dwell in all climates, nothing else can. In the south of Europe potatoes are less extensively cultivated than in the north; chiefly because the climate is unfavorable to their growth, as Louisiana is less suited to their culture than Maine. Whereas in the south of Europe, Indian corn is raised abundantly, while in the north it is scarcely known. Such facts teach us the importance of commerce. It not only exchanges the productions of different countries, but it transfers fruits, and vegetables, and flowers, and trees, to places where they are needed, and where they will flourish. The potato, originating in the mountains under the equator, has extended its range, north and south, over a space wider than that occupied by any cereal grain, and furnishes food for millions of the human race.

2. *Its Uses.*—The influence of different kinds of food upon the civilization of nations, is a subject that might well engage our attention. I shall only observe, that as nations advance in civilization, they require a greater variety of food, and more skill in its preparation. Savages live on a few articles, and those imperfectly cooked. Those persons who commend the superior simplicity of savage fare, and condemn the refinements of modern living, forget that savages neither live long, nor increase their numbers. Man is an omniverous animal. His teeth and stomach show that he was made to eat flesh, vegetables, and fruit; and generally we find that health and comfort are promoted by a due admixture of all. Neither the Esquimaux, who live on animal food, nor the East Indians, who live chiefly on rice, attain a high development of body or mind.

Ireland may be quoted as an illustration of the social results of living on one or a few articles of food. We may presume that, before potatoes were introduced into general use, the Irish lived, as the English did, on meat and bread; and it is certain that if the English were to abandon meat and bread, and undertake to live on potatoes, they would incur the same risk of starving that the Irish do. Even in favorable years there is a time of six or eight weeks, just before harvest, when the Irish poor endure intense privation. When a nation is reduced to one article of food, and that the cheapest, the difficulty is that, in a bad season, they have nothing to fall back upon—they are

already at the bottom of the hill. Had they lived on meat and grain, they might have substituted a coarser fare; but there is no going behind the coarsest. Considering the peculiar social state of Ireland, and especially the distribution and tenure of land, the introduction of potatoes can scarcely be regarded as a blessing. True, doctors disagree. Humboldt says that, "from time immemorial, no plant has had so decided an influence on the prosperity of mankind as the potato." * But Dr. Smee observes that "the potato is a plant of indolence, and politically injurious to the community, when extensively employed. In Ireland it has begotten millions of paupers."†

Still every one knows that, in ordinary circumstances, potatoes are a profitable crop, and that they contain all the materials requisite for nutrition. Let two acres of land of the same quality be cultivated, one with potatoes, the other with wheat. Suppose the potatoes to yield two hundred bushels, weighing ten thousand pounds; of this weight, one-quarter is solid matter. We may admit the wheat to yield twenty-five bushels, weighing fifteen hundred pounds; of this, twelve hundred pounds will be solid matter. How far these two portions of solid matter will go towards supporting animal life is not so easily settled. The potato has nearly as much of nutritious starch as wheat. It has carbon, nitrogen, phosphorus, and lime, for the development and support of the lungs, muscles, blood and bones. In gluten it is deficient, and cannot, therefore, undergo panuary fermentation and form a light loaf. In this respect wheat flour stands before all other articles of vegetable food; yet wheat alone does not appear to be capable of supporting prolonged human existence in the best health. Perhaps we should be safe in asserting that, if one man was kept on bread made of pure, fine wheat flour, and another on good boiled potatoes and salt, the latter would live longer, and enjoy better health. The bread is favorable to the increase of strength, and probably, for a short time, the bread-eater could do the most work, while the other would have better health, and last longer. Indeed the best wheat bread is improved by the addition of potatoes,

* New Spain, vol. ii. p. 449.

† Smee, on the Potato Plant, p. 160.

to the amount of one-quarter of its weight—a fact well known to bakers.

Repeated experiments show that good potatoes, cooked by boiling, form a nutritive article of food; and that baked potatoes are less nourishing than boiled ones. I will mention two, out of many experiments made in Glasgow prison:—First. Breakfast, one-half pound oatmeal in porridge, with one-half pint of buttermilk; dinner, three pounds boiled potatoes, with salt; supper, five ounces of oatmeal and one-half pint of buttermilk. Ten prisoners were put upon this diet; they were confined for two months, employed in light work. At the beginning of the experiment, eight were in good health, two in indifferent health. At the end of the time, all were in good health, and had gained, on an average, more than four pounds, only one man having lost. The greatest gain was nine pounds four ounces. The one who lost was reduced five pounds two ounces.

Another set received the same fare, excepting that the potatoes were baked. They were found far less nutritious than the boiled. The prisoners lost, on an average, one and a half pounds. The subsequent addition of a quarter of a pound of meat did not add to their weight.

In the *second* experiment, ten prisoners were fed thus: breakfast, two pounds of potatoes boiled; dinner, three pounds; supper, one pound per man. At the end of two months, the health of all was good; there was an average gain in weight of nearly three and a half pounds; the greatest gain, eight and a quarter pounds; only two lost a trifling quantity. The prisoners all expressed their satisfaction with this fare, and regretted the change back to the ordinary diet.

It should be remembered that these experiments were made upon persons confined only to light labor. Probably potatoes would not furnish sufficient strength for long continued hard work in the open air.

Almost all domestic animals are fond of potatoes, and, in moderate proportions, they are wholesome, if not very nutritive, to cattle and hogs. Almost every farmer has his peculiar ideas upon this point, gained by his experience. Some of great experience do not think them profitable, if the expense

of boiling and mashing with meal be taken into account; yet they admit that they are valuable as an alterative. Loudon, good authority in England, does not think they are as profitable a crop for stock as ruta-bagas, carrots, or turnips; but opinions differ widely on this point. Low,* Professor of Agriculture at Edinburgh, says, that "when boiled, they afford food in a high degree nourishing and salubrious." They may be given to dairy cows, or to any kind of cattle, for the purpose of fattening; but it is observed that boiled food is not generally attended with the same benefit to ruminating as to other animals. To hogs it is given with the best effect. Even Loudon used to feed horses on potatoes, boiled and mixed with cut hay and straw, and judged that for this purpose, one acre of potatoes went as far as four acres of hay. In Scotland, this kind of food is given to horses, even when on the hardest work, and is found both wholesome and economical.

In this stage of our experience, it is impossible to affirm any thing positively, as to the comparative value of potatoes as food for cattle. It is worth while for farmers to repeat and continue their experiments, keeping accurate accounts of the expense and the results.

3. *Planting.*—What ought we to plant? Large potatoes or small? The whole or a part? Or without reference to these distinctions? The reason is not evident, or, to say the least, has not been confirmed by sufficient experiment, why we should depart from the analogy of other things, which we must do, if we select for seed the smallest and poorest potatoes. We purchase, at high prices, the ripest and soundest corn, wheat and oats. We carefully save that stem of a cabbage which ripens first. In raising domestic animals, we choose for parents, the noblest specimens of their respective species. Deterioration follows a neglect of this rule. But of late years, some farmers have chosen small potatoes for seed, and justify their choice by its results. It is possible that a large crop may be grown from such seed. But has the experiment been tried on a scale sufficiently large to justify us in laying down a general rule? One of the most intelligent farmers in this

* Elements of Practical Agriculture, p. 425.

county prefers small seed potatoes, for the reason that they are *less ripe* than the largest; that they have a greater power of reproduction than those which have exhausted their energies in growing and ripening; and that plants raised from unripe tubers are earlier and stronger than from over-ripe. If there is any force in this reasoning, would it not be better to dig the potatoes intended for seed a little before they are quite ripe, when the stalk begins to wither, and then to save for planting, the fairest and largest? These will produce not only larger potatoes, but a greater number of them.

The best cultivators in England, plant only the finest specimens. Professor Low says, "when proper care is bestowed, large and well-shaped tubers are selected for planting." Von Thäer says, "small tubers have not the same power of germination as larger ones." Mr. Knight plants potatoes whole. When anxious to get the very earliest, he removes all the eyes but one, that the growing stem may get an abundant support. He starts that in a hot-bed, and transplants as soon the weather will allow. By this method, we have known potatoes to be ripened a fortnight sooner than they could have been ripened by common field culture. Humboldt calls the cutting of the roots into small pieces, a bad custom, which occasions degeneracy. But for main crops, Mr. Knight cuts large potatoes, probably from regard to economy, while others of equal celebrity, insist that it is better to plant the tuber whole. Some think one eye sufficient, on the principle that the strength of the stem will depend, at the outset, on the piece planted from which it derives its nutriment. This would forbid the planting all the seed; for where a great number of eyes shoot up together, the stems must be weak. And where the stems are weak and crowded, we may expect a small crop of small roots. It is well known that eyes from the seed end of the tuber furnish the earliest crop, especially if one eye only is left upon the whole root.

The plant forms tubers until the flowers appear; after that time it ripens them. Some cultivators infer from these facts, that if you would have the fruit ripen early, you must remove the flowers and flower-stocks, that none of the energies of the plant may be expended in ripening the seed. Mr. Knight

asserts, that cutting off the blossoms also increases the yield. He puts the additional yield up to the high figure of one ton to the acre. The early formation of the tubers is said to delay the blooming; while the blooming and the ripening of seed delay the growth of the tubers. Hence the practice of compelling some early kinds to produce blossoms and seeds contrary to their habits, namely to remove the tubers from the hill as they are being formed. By this means all the energies of the plant are concentrated upon the stem and the organs of fructification, and blossoms and seeds are produced.

The time of planting, the quantity of seed, the kind of soil, the amount and quality of manure, the method of culture and preservation, are all worthy of special notice; but the limits assigned to this essay forbid us to enter upon them.

4. *Diseases.*—All other disorders to which potatoes are liable, are overlooked in the presence of the modern rot. A disorder so wide spread and so destructive has, of course, attracted the attention of practical and scientific men in many countries; and all the resources of learning and skill have been applied to the investigation of its causes, and its remedies, hitherto, with small success. At least they have only shown, not what the cause is, but what it is not. The universality of the evil proves that it could not have been occasioned by blight, insects, climate or soils; for it is not to be supposed that these were everywhere, and, at the same time, coöperating to one end. Besides, these causes existed long ago, and did not produce the results we now witness. As to insects and fungi, they may be regarded rather as effects, than as causes of the disease. A true theory must account for all phenomena, and a true remedy reach all similar cases. In both points recent researches have signally failed; and from various quarters we learn that investigations are abandoned in despair of attaining a satisfactory solution of the difficulty.

I am not disposed to increase the number of unsuccessful physicians; but shall only suggest a few thoughts respecting the proximate causes or aggravations of the disorder. I suppose they are nearest to the right, who consider the continued propagation of the plant without renewal from it original climate and soil, and its over-stimulation by strong manure, as,

at least, secondary, or auxiliary causes of its decay. We should not forget that the plant we cultivate is not the original potato in its native home, where it doubtless preserves its health from age to age, like other wild inhabitants of the forest. Scarcely any foreign plant has been subjected to a discipline so severe; to methods of culture so different from what nature appointed for this. For some purposes we have changed it for the better; for instance, in the quantity and quality of its tubers—making them not only an abundant but palatable article of food. But this result may have been attained at the expense of health. Not that the potato is actually running out and is about to die. That seldom occurs to any plants, and especially unlikely is it to occur to those propagated only by seeds; although they may and do degenerate to such an extent as to render their cultivation unprofitable. And this process is hastened by modes of culture different from those by which the plant naturally propagates itself. In its wild state, the potato produces small tubers and long tops. We have increased the fruit and diminished the amount of stems and leaves—an operation that may have occasioned a great change in its constitutional condition. The energies of the plant are withdrawn from its own nutrition and determined towards the production of fruit to such a degree as to cause its debilitation and decay—an effect with which we are familiar in fruit trees. In a temperate, mountainous country, it probably continues to live in high health. But it has been transported to every variety of climate and of soil, and excessively, and of course, unnaturally, stimulated for the sake of large crops. We know the effects produced on some other plants by a similar course. If a pear tree is over-stimulated, the new wood will not ripen. If wheat is over-stimulated by animal manure, the stalk is rank, tender, liable to rust, and bears no fruit, or very little. Some garden vegetables, so treated, disappoint our hopes altogether. Why may not similarly unfavorable results occur in potatoes, by pursuing a course of treatment so foreign from that which nature observes? Why are potato plants grown on a good but unmanured soil, less liable to rot than others? Because, in this respect, they are situated more like the wild plant. Excessive stimulation by manure increases the amount of cellular texture, and makes the

tuber softer and more spongy—and hence more subject to decay; more likely to be affected by unfavorable atmospheric conditions. And when this course of unnatural treatment is continued for two centuries, it is not strange that, although the amount of yield is increased, it may be done by undermining the health, and perhaps diminishing the vitality of the plant. Probably nature has limits beyond which her perversion cannot be carried with impunity.

Besides, in its wild state, the potato propagates itself by seeds as well as by tubers. From recently grown seeds, it annually renews its youth and health. And wild plants, which reproduce themselves without human aid, resist tendencies to disease better than cultivated ones. But we have checked the potato in its habit of reproduction from seed, because we wanted an increased yield of tubers—a result attainable, in part, by preventing the plant from following out its natural tendency to produce seed. We gain in one direction, and lose in another.

It has often been suggested, that we might, perhaps, recruit the failing health of the potato, by raising it from seed; and experience teaches us, that potatoes so raised are usually best for the table. But seedlings rot as much as potatoes raised from tubers. Why not? They come from the seed of diseased tubers. The seed partakes of the general deterioration. Whatever may have been the primary cause of the disease, it has infected the whole plant. And raising from seed neither invigorates the vegetative principle, nor checks the tendency to decay. There is a defective constitution, the vitality of which cannot be so restored. The disease is a constitutional debility, resulting from the unnatural circumstances in which the potato is placed, analogous to readily acknowledged causes of decay in other plants. Some kinds do not rot much; others are almost destroyed; and all kinds are more or less affected. Some may have been cultivated for a shorter time than others, and now have a sounder health. We may also be ignorant of some conditions, which, besides long-continued and unnatural cultivation, may be requisite to produce the result. Where it is so difficult to pronounce positively upon the primary cause of the disease, may we not be justified, in the absence of

any other tolerable theory, in regarding the result as proof of deterioration?

Does it not favor this theory, that potatoes planted on light, dry, and especially on new land, are less liable to rot, than on heavy, wet, and manured land? It is reasonable that this should be so, because the former condition is an approximation to that of the original plant. Potatoes thus grown will produce a smaller stem and fewer leaves, and though the tubers may also be small, they will be good flavored. In the new and fertile land on the bayous of Louisiana, the tubers are said to be as large and as good flavored, as dry and nutritious, as any raised elsewhere. From Bermuda also are brought our best early potatoes. If such a culture will not restore health, it may cause the disorder to assume a milder form. And while the whole subject is environed with doubt, and the origin of the disorder has baffled the sagacity of the wisest phytologists, we may well speak with modesty of remedies. But there seems to be reason in planting either on new land, or on light land, enriched with straw, clover, leaf, or other vegetable manure. Whatever manures be used, the land should be light and dry, and easily accessible by the sun.*

Great care should also be exercised in selecting and planting the finest varieties of seedlings. Nor should it be forgotten that too much importance has been attached to the transportation of potatoes for planting to localities distant from those in which they grew. The gain from that practice will hardly pay the expense. Seedlings adapt themselves to their home, and do as well there as elsewhere.

But it seems to me that our chief hope of success lies in planting potatoes and seed brought directly from their native country and their wild state. Even should it be true, as it has

* It may be in place here to inquire whether a part of the failure of the potato crop may not have resulted from the slovenly manner in which this plant is frequently cultivated. We plough once, throw into a hole some strong manure, and press upon it the half-pulverized earth. Heavy rains beat down the ground, and render it so solid as to be almost inaccessible to atmospheric influence. If the ground were ploughed deep, then cross-ploughed, then harrowed and made fine and light, so that the sun, air, and rain might have free access to the plants, there is reason to believe that the increase of the quantity and the improvement of the quality, of the crop, would repay the additional expense.

been sometimes asserted, that such a course is not absolutely certain to be successful; yet it is much more likely to be so than any hitherto proposed. We can thus start anew; and with the multiplied facilities of science, and with hosts of intelligent farmers and gardeners, we may, in a comparatively short time, restore this important plant to its former health and productiveness. It is the duty of those having the means and opportunities, to use them in a work so intimately connected with the pecuniary and social prosperity of the people. Nor would it be improper for the government of the United States to instruct its diplomatic agents to institute inquiries, and to make personal examinations touching this subject, in other countries. It is said * that there are some kinds of potatoes cultivated in South America superior for table use to any known among us.

We have heard that distinguished agriculturists in this county have received and planted wild potatoes from New Mexico. We have read also in the Patent Office Reports, statements that wild potatoes, or what have been thought to be such, have recently been found in that part of the country. It is well to receive this latter account with caution. Humboldt, and other eminent botanists, assert, that the potato is indigenous only in Chili; yet recently it has been said that wild potatoes have been discovered in Peru.† Certainly they have never before been found in North America. There are many plants with tuberous roots, and inaccurate observers may possibly have mistaken some of these for potatoes.

In conclusion, I would observe that the potato disease will answer at least one good purpose "if it compels us to extend our knowledge to other kinds of food, which have been till now either unknown or unappreciated." Is not our prejudice against new things inconsistent with our general enterprise? Perhaps rice, sago, tapioca, and oatmeal, would not furnish a complete substitute for potatoes; but, with a genius for cookery, they might be worth more than we now make them. One-third of all the people on earth are mainly supported on rice. Would not that be a good fashion which should bring it into more

* Sabine, Lond. Hor. Soc. Trans., vol. v. p. 249.

† Lambert's Journal of Science and Arts, vol. x.

common use among us? Motives of patriotism might unite with those of economy. There is a tradition that, in the early times of Massachusetts, the people agreed to use salt fish for dinner one day in the week, as an encouragement to the fisherman. Salt fish dinners on Saturday still commemorate the fact. It is easy to imagine how rice might be more extensively used in our domestic economy; and that we might find it both palatable and profitable. The introduction into general use of a new vegetable would render us less dependent on present supplies, and cause less regret for the failure of any, however important.

The following table has been prepared by the Hon. John Brooks, of Princeton, designed to show the cost of the cultivation of carrots, as reported in several successive years in the Worcester Transactions:—

TABLE.

Date.	NAME.	Rods.	Tons.	Cost.	Cost per Ton.	Pounds per Rod.
1846	Harvey Dodge, . .	40	5.48	$20 00	$3 64	274.40
1847	Willard Earle, . .	40	3.97	20 50	5 16	198.75
1847	Harvey Dodge, . .	41.85	6.27	21 70	3 46	299.49
1847	P. H. Perrin, . .	40	4.84	23 80	4 91	242.20
1848	Harvey Dodge, . .	80	12.91	49 92	3 86	322.87
1848	William S. Lincoln, .	43.75	5.35	20 81	3 88	244.48
1848	William A. Wheeler, .	160	25.27	120 25	4 75	315.93
1849	Harvey Dodge, . .	125	15.60	80 06	5 13	249.60
1849	William S. Lincoln, .	40	4.62	21 79	4 71	230.70
1849	William A. Wheeler. .	160	26.66	153 17	5 74	333 28
1850	Harvey Dodge, . .	232	18.96	86 77	4 57	163.46
1850	William S. Lincoln, .	120	8.82	67 59	7 65	147.04
1850	Charles White, . .	80	8.70	54 25	6 23	217.50
1850	B. N. Child, . . .	40	5.77	25 62	4 44	288.75
1852	Jonathan Warren, . .	80	11.50	59 00	5 13	287.50
1852	Samuel Perry, . .	160	22.95	92 50	4 03	286.87
1852	Harvey Dodge, . .	101.7	14.22	67 10	4 75	277.82
1853	Thomas W. Ward, . .	72.75	6.84	59 50	8 69	188.13
1853	Harvey Dodge, . .	120	13.35	45 87	3 43	222.50
1853	Jonathan Warren, . .	80	9	48 00	5 33	225.

Average cost per ton, $4.97; produce, per rod, 250.81 lbs.; average crop, per acre, 40,129 lbs.; 20.06 tons per acre: 6.2 cents per bushel of 50 pounds, nearly.

Ten largest crops, average, 293.60 lbs. per rod—average cost per ton, $4 48.4
Ten smallest " " 207.97 lbs. " " " 5 45.6

$9 94.0

$4 97.0

ESSEX.

Seven entries for premium were made. They have not had an opportunity of examining any of the crops at any stage of their progress, not having been notified of any entries being made until called together to examine the several statements of the applicants for premium. They do not consider themselves as well qualified for the discharge of their duty as if they had seen the crops during their growth.

They have endeavored to examine the several statements with care, and see no reason to doubt their fairness and truth, as none of them exceeds what might be reasonably expected on a rich soil with the best cultivation. But they are of opinion that, in all like cases, a certificate of the measurement of the land, and of the measure and weight of the crop, should accompany the statement.

DEAN ROBINSON, *Chairman.*

J. Longfellows' Statement.

The crop of onions which I entered for premium has now been harvested, and I herewith transmit the result. From one-half acre of land measured by G. W. Adams, I have taken 386¾ baskets of ripe onions. I weighed six baskets, the heaviest weighing fifty-nine, the lightest fifty-seven pounds, I call them fifty-seven. One-half of the land has been in onions three years; the remainder one year, except about eight rods, on which onions have not been sown until last spring. The crop last year was very much injured by the grub worm, and considerable of the ground was set over with cabbage. The land is a dark, sandy loam, and was not ploughed at all last spring. It was liberally manured with a compost of meadow muck and stable manure, and about five bushels of salt and five bushels of wood ashes to the acre, and well worked with the cultivator, harrow and hand-rake. The seed (Danvers yellow) was sown about the first of May, three and a half pounds to the acre. The ashes were sown after the seed.

I have not kept an accurate account of the cost of manure and labor on this piece of land, but suppose it cost me as much

as the same would cost any other man, say seventy-five dollars for manure, labor and interest on land. My crop is sold at sixty cents per bushel, delivered at the depot, one and a half miles from my place of residence.

This is to certify that I assisted in harvesting, topping, measuring and weighing, the above lot of onions, and that the above statement is correct.

EDWIN VANCE.

BYFIELD, November 7, 1853.

I hereby certify that I measured the ground cultivated as above stated, and it contains one-half acre and no more.

GEO. W. ADAMS.

NEWBURY, November 7, 1853.

Statement of Ephraim Brown.

Statement of quantity of onions, ruta-baga turnips and carrots, raised on one-half acre of land to each crop, viz.:—

407 bushels onions, fifty pounds to the bushel.
460 " turnips, sixty " " "
41,400 pounds carrots, or twenty tons two quarters, and four hundred pounds.

The land on which the above were raised has been planted with root crops and squashes the three past years, and has been manured liberally with compost of rotten kelp, meadow mud and barn manure. The crops have been carefully cultivated—all weeds kept down. The soil is a strong black loam on the Marblehead Neck.

MARBLEHEAD, November 15, 1853.

WORCESTER.

From the Report of the Committee.

The entries for premiums on roots the present year, were less than those of last year, and confined exclusively to carrots, no entries for potatoes having been made, owing, undoubtedly, to the prevalence of the potato rot, in the early part of autumn.

Only four entries of carrots were made, and one of these was withdrawn after the committee had examined it. This was rather a matter of regret to them, inasmuch as the competitor is one of the pioneers in the cultivation of the carrot crop, and received the highest premium awarded by the society, for his crop of last year. They were desirous of having his statement, though his crop was undoubtedly much smaller than that of last year, as much that is valuable may sometimes be learned from an unsuccessful effort. The three competitors on carrots, who made returns to the secretary, were Thomas W. Ward, of Shrewsbury; Harvey Dodge, of Sutton, and Jonathan Warren, of Grafton.

Had the committee been at liberty to award a premium for the most minute and accurate return of the expense of raising the crop; the condition of the land on which it was grown, and all the material facts relative to it, they would have given Mr. Ward the first premium. But being restricted to a certain amount of land, and to a certain weight of roots on that land, in order to entitle competitors to any premium, and Mr. Ward falling short of the specified amount, in both of these particulars, he is not entitled to any premium.

By his statement, which follows, it will be seen that, although unsuccessful as a competitor for the society's premiums, he has nevertheless demonstrated the important fact that a net profit of $29.46 was obtained from the seventy-two and three-fourths square rods of ground on which his carrots were grown, against nine hundred and nineteen pounds of hay, which was the entire *pro rata* product of the same piece of land last year. Mr. Ward estimated his carrots at only $10 dollars a ton, whereas Mr. Dodge sold his on the ground at $12 per ton.

Statement of Thomas W. Ward.

Herewith you have a statement of the carrot crop, entered by me for the society's premium. You will see by the certificates that I am minus both in quantity of land and crop. I thought, however, that I would make "due return," and abide the default.

The crop was much more even where the perfectly rotted manure was put, than it was where the compost from under the

barn was spread. The roots, where the latter manure was put, were some of them very large and long—others were small; some were very sprangling and uncomely in shape. I think there was more weight of roots from the same quantity of ground where the fine manure was used, than where the cellar manure was put.

In calculating the value of the crop, I reckoned forty-six pounds to the bushel, which I ascertained by measuring one load which was weighed, and then cast them at thirty cents per bushel, which is what they are sold at in this place, which, if I am right, will bring them at about $6\frac{1}{2}$ mills per pound.

My loads of roots were nearly of the same size, but they varied exceedingly in weight, according to the size of the roots. The load which I measured was of medium sized root.

The land in 1852, was in grass, and the product of hay was at the rate of one ton to the acre. In 1845, the land was well manured and cropped with corn; in 1846, it was cropped with oats and seeded with clover and herds-grass seed, since which time it has been mowed, receiving no manure till last spring, at which time, nine cart-loads (of twenty-five bushels) were applied to it—one-half the droppings of the cattle, and one-half loam or muck, composted in the barn cellar, and nine cart-loads of compost manure from the yard of summer manure, made of muck, loam, refuse hay, and the droppings of cows while yarded in summer. The sward was turned on the 31st day of May, with No. 33 sod and subsoil plough of Ruggles, Nourse, Mason & Co.'s manufacture, which worked most admirably. The manure was then spread and harrowed in, and then the ground was thoroughly brushed with a bush harrow—nothing more was done. I used one pound and a half of orange carrot seed. It was sown June 3d, with a seed-sower which was old and not suitable, as I found before I had finished sowing. Hoed and began to weed, first time, about June 28th; July 11th, gave them the second weeding; August 2d, weeded a third time, and August 11th, went through them with a hoe. Gathered them from October 29th to November 4th, inclusive. I ploughed near to the row and then drew the root with the hand.

Ploughing three-fourths of a day—two men and two yoke of oxen—equal to 1½ day for one man and the same for one yoke of oxen; carting and spreading manure, harrowing and brushing—two days for one man and one yoke of oxen—calling a day of ox work equal to a day of man's work, you have, for one man, in preparing the ground, ...	7 days
Sowing the seed, one man, half a day, . . .	½ "
In all, fifteen days for one man in weeding and hoeing,	15 "
In all, fourteen days for one man's harvesting, . .	14 "
Two and a half day's work of oxen, ploughing out and carting carrots, ...	2½ "
Total labor, ...	39 days
For seed, $1.50—Manure, (the ground retaining half the value,) $9.25, ... $10 75	
For 39 days' cultivating and harvesting, . 48 75	
	$59 50
Total value of crop, 13,687 pounds of carrots, at 6½ mills per pound, ...	88 96

Shrewsbury, November 5, 1853.

Mr. Dodge, of Sutton, entered two lots of carrots for premium; one containing a quarter and the other half an acre. His crop on the quarter weighing only 9,250 pounds, will not entitle him to a premium, as the rules of the society require the weight of roots on that amount of land to be ten thousand pounds. On the half acre entered by Mr. Dodge, it will be seen by his statement which follows, that he raised 17,450 pounds of carrots at a *pro rata* cost of $30.58, yielding thereby a net profit of $72.12, on a single half acre of land.

Mr. Dodge, either from his long experience in growing root crops, or from some other cause, seems to have acquired the faculty of raising carrots with less expense than other people. It will be seen by comparing the statements of the three competitors the present year, that Mr. Dodge cultivated three-quarters of an acre at an expense of $45.87 only; whereas Mr. Ward cultivated only seventy-two and three-fourths square rods of ground, being seven and one-fourth rods less than half

an acre, at an expense of $59.50. The cost of cultivating the half acre entered by Mr. Warren, as stated by him, was $48. The committee state these facts here, hoping that the difference in the expense of cultivation, as shown by the above statements, will induce those interested in the raising of root crops, to investigate the cause of so great apparent discrepancy.

Statement of Harvey Dodge.

I herewith hand you a more condensed statement of the expense and product of the two lots of carrots grown on my farm in Sutton, the present season. As the cultivation was the same on both lots, both being manured alike as near as possible, I propose condensing the cost of cultivating the two lots into one form, believing that I shall be understood if I show the products of the two separately, as the lots were surveyed and the products of each kept by itself as will be seen below.

Expense of crop on one-fourth and one-half acre:—		
Two hundred bushels of leached ashes, at 6¼ cents,	$12 50	
Three ploughings, man and a pair of horses,	6 00	
Bush harrowing, same team,	75	
One and a half pound of seed at 75 cents,	1 12	
Sowing same with machine,	50	
Boy's labor 23 days, weeding and cultivating, at 50 cents per day,	11 50	
Three men, three days, digging carrots,	9 00	
Three boys, three days, cutting tops and tending teams,	4 50	
		$45 87
Value of crop:—		
9,250 pounds on the one-fourth acre, sold for $12 per ton,	$55 50	
17,450 pounds on the one-half acre, sold on the lot for the same,	104 70	
		160 20
Net profit,		$114 33

The committee will notice that I have not added interest of land to the bills of expense, which is worth $300 per acre for agricultural purposes, which would amount to $13.67. Against this I put the tops, which are a valuable feed for stock, worth $5, and the balance of interest I think the committee will agree should go against the growth of fifty young apple trees of three and seven years growth.

The method of cultivating has been about the same the present season, that I have recommended for the last ten years, namely, deep and clean culture, and all the work to be done while the sun shines. No weeding or hoeing should be permitted in wet weather, or while the dew is on, as it always increases weeds. A hand cultivator has been used by me for the first time, this season, and with marked advantage; I think it saves twenty per cent. of all the labor. I take the present opportunity to say that I have changed my mind in relation to thinning the crop; a few rows being left and not thinned out at all, gave more weight than those thinned to stand two inches apart. In regard to using leeched ashes for manure, I have had but little experience until this year. Having used about one thousand bushels on my root crop this year, I know nothing of the effect they will have on the land in years to come. The crop was much more free from weeds than in former years, when compost or stable manure was used, and the same remarks can with safety be made in regard to grubs and worms, which have of late years become very troublesome, owing, no doubt, to the indulgence of farmers in permitting idle boys and sometimes would-be men, to hunt and destroy a large share of the feathered tribe, which a wise Providence evidently intended to aid us in destroying worms and insects. Have we not a right, as well as the mechanic, to write on our gate posts, *No admittance without a permit?*

SUTTON, November 8th, 1853.

Mr. Jonathan Warren, of Grafton, entered half an acre, upon which, it will be seen, he raised three hundred and sixty bushels of carrots. He produced a weigher's certificate, stating that eighty bushels of them weighed 4,016 pounds. In that proportion, if the eighty bushels which were weighed were an

average weight of the whole crop, the three hundred and sixty bushels would have weighed 18,072 pounds; being 3,072 more than the minimum weight required by the rules of the society, to entitle him to a premium. The committee had no other means of arriving at the entire weight of his crop, than by applying the rule of proportion as above. It will also be seen that the total value of his crop was $93, and the cost of raising $48, leaving a net profit of $45 on his half acre.

Statement of Jonathan Warren.

The lot on which the crop of carrots which I enter for premium was grown, contains one-half acre. The lot was grass land, and ploughed in May, 1852, and had been mowed ten years. It was planted with corn in 1852, and sixty loads to the acre of horse and hog manure applied to it, and produced sixty-five bushels of corn to the acre. The land was in good condition in the spring of 1853; eleven loads barnyard manure were applied to it, and the ground was ploughed twice, harrowed and bushed afterwards. I used one and a half pound of seed which was sown June 8th; weeded three times; commenced harvesting November 1st and finished the 5th. The amount of product was three hundred and sixty bushels.

Amount of labor performed:—

Preparing ground,	2½	days.
Sowing,	½	"
Weeding,	16	"
Harvesting,	10	"
Total,	29	days.

Expense of seed, manure and labor of cultivation,		$48 00
Value of carrots,	$90 00	
" tops,	3 00	
		93 00
		$45 00

The committee visited a number of lots of carrots besides those entered for premiums, among which was that of William

S. Lincoln. He raised a fine crop for this season, and it was the opinion of a majority of the committee, judging from the appearance of his carrots as compared with others before they were harvested, that if Mr. Lincoln, the farmer, had made an entry of his carrots with Mr. Lincoln the recording secretary of the society, he would have had more than an even chance for a premium.

William T. Merrifield, of Worcester, raised a crop upon the same piece of ground upon which he raised a very large crop last year; but owing to the severe blight with which the carrot crop was very generally afflicted in this vicinity the present year he did not obtain half the amount which he raised on the same ground last year.

Two of the committee examined a crop belonging to William A. Wheeler, of Worcester, upon which he also raised a very heavy crop last year. Mr. Wheeler's theory is, that in order to grow carrots successfully, the ground should be worked very deeply, thereby obtaining, as he thinks, a greater length of root, and consequently a greater weight from the same amount of land. He caused his ground this year to be spaded to the depth of two feet or more; but his crop of carrots was very small, and much shorter than the average of those examined by the committee. His crop suffered from the drought in the early part of the season, and the tops were smitten with a blast in the month of September.

The field of carrots entered by Capt. Samuel Perry, of Worcester, suffered severely from the blight which came upon them in the latter part of September. The principal portion of his field was sown during the last week of May. A small patch in the same field was not sown, for some cause, until late in July. The carrots on this piece were very large, and the tops not in the least affected by the blast. The inference from these facts would seem to be, that if the whole field had not been sown until July, there would have been a much larger crop the present season at least; but whether the same result would occur again in one year out of ten, is quite uncertain.

From all the examinations which the committee have made, and from the best information they have been able to obtain from those most experienced in the culture of the carrot crop,

they are fully persuaded that it is not advisable to thin out the carrots as many do, in the early part of the season. Very large carrots are not desirable for the reason that they are generally either hollow in the centre, or else consist of a hard woody substance, which renders them much less nutritious than those of a medium size, yielding, also, a less weight on a given portion of ground.

WARREN LAZELL, *Chairman.*

WORCESTER WEST.

Statement of George H. Lee.

Potato.—I hereby certify that from one acre of ground, the present season, I have harvested three hundred and forty-five bushels of potatoes. The sward was turned early in the spring, as soon as the frost would admit, and immediately planted on the top of the furrow, in drills. They were hoed twice. Previous to the first time they were plastered. The variety is called the Holland potato.

BARRE, November 5, 1853.

Statement of John T. Ellsworth.

Carrots.—I had sixty-four rods of ground, on which I raised three hundred and seventy-four bushels, or eighteen thousand seven hundred and nine pounds. On forty rods I had two hundred and thirty-eight bushels, or eleven thousand nine hundred and forty pounds. A corner of the lot was damaged very much by the grasshopper and woodcock. As the rest yielded, there would have been in the whole lot twenty bushels more. I drew fifteen loads of stable manure on the lot, in two piles. It laid three weeks, when I turned the manure over and ploughed the land as deep as I could. The 16th May I sowed them, using the eagle plough to open the drills, and having the oxen go twice in a place as nearly as possible, leaving the land in drills. I then spread the manure in the furrows quite plenty, and with the same team split the drills so as to raise a drill directly on the manure. I then used a hand rake to brush the

stones and lumps off, if any. Before using the rake I ran a hand-roll over it to bed and settle it so that the seed sown would work well. I took the two corner teeth out of my cultivator, and used it with a horse. The rows would average about twenty-two inches apart. I calculated to sow them about three inches apart.

In digging I ploughed by the side of them, deep, and close to the roots so as to see them, and could then pull them up with ease. The roots were so large it was very fast harvesting.

Expenses of crop:—

Ploughing the land,	$1 50	
Fifteen loads of manure—ten of which to carrot crop,	10 00	
Opening and covering drills, spreading manure in drills, raking, rolling, and sowing seed,	7 00	
Carrot seed,	1 00	
Drawing manure to lot and turning heap,	2 50	
Cultivating as soon as could see the plant,	50	
Cultivating and weeding, first time,	4 00	
Cultivating and weeding and thinning,	4 00	
Pulling large weeds and cultivating,	50	
Harvesting crop,	7 50	
Interest on land,	3 37	
		$41 37

Credit to land:—

Three hundred and seventy-four bushels of carrots,	$93 50	
Carrot tops,	1 50	
		95 00
Balance to crop,		$53 63

The land was about one-half sown three years, the rest two years in rotation.

I sold some of the roots at twenty-five cents, and think the remainder are worth that to me to feed.

Cost of carrots, a trifle over eleven cents per bushel.

HARDWICK, November 28, 1853.

Statement of Joseph Robinson.

The crop of carrots I offer for premium was six hundred and sixty-six bushels, grown upon one hundred and twenty-nine square rods of ground, which has been sown with carrots the last four years. I have spread yearly twelve loads of heap manure, and ploughed it in about the middle of May. Ploughed the ground once, cultivated twice, and then bushed the ground for sowing. Sowed the carrots the last week in May, the rows about six inches apart, with a seed-sower; hoed three times, and harvested last of October.

		Cr.
Six hundred and sixty-six bushels carrots, at twenty-five cents,		$166 50
		Dr.
Manure,	$12 00	
Ploughing, cultivating, &c.,	4 00	
Sowing and seed,	3 00	
Hoeing,	16 00	
Digging,	8 00	
		$43 00

WORCESTER NORTH.

Statement of Isaac B. Woodward.

Carrots.—The ground was manured with four loads of green manure, on the 6th of May, and ploughed in. It was ploughed deeper on the 17th, and the carrots were sown on the 18th of May, in rows, about fifteen inches apart. They were hoed three times during the summer, and were dug about the first of November. The amount grown on an average square rod was $357\frac{5}{8}$ pounds, making $7{,}152\frac{1}{2}$ pounds or $143\frac{1}{20}$ bushels to the eighth, or $1{,}144\frac{8}{20}$ bushels to the acre.

The same field has been sown with carrots for three years, and has been manured nearly the same every year.

The cost of cultivation was as follows:—

Manure,	$4 00
Ploughing, twice,	1 00

Raking and sowing,	$0 33
Hoeing, three times,	3 00
Harvesting,	3 00
Total,	$11 33

This lot contained one-eighth of an acre. On another lot of the same size there were 347 pounds to the square rod, which is at the rate of 138⅘ bushels to the eighth, or 1,110 bushels to the acre.

Statement of Leonard Day.

Carrots.—The ground was ploughed in the fall, and again in the spring; the ground prepared and the carrots sown about the last of April. The amount grown on eighty-four rods was six hundred and fifty bushels.

Cost of cultivation as follows:—

Two ploughings,	$2 00
Preparing the ground,	1 50
Sowing,	50
Weeding twice	6 00
Harvesting,	25 00
	$40 00

HAMPSHIRE.

Statement of O. and F. H. Williams.

Carrots.—The half acre of carrots which we enter for premium is a sandy loam. Part of it was in carrots last year, and the remainder has been in grass for twenty years. We ploughed with a Michigan plough, eight inches deep, and planted in rows from eighteen to twenty inches apart.

Value of crop:—

348 bushels, at 25 cents,		$87 00
Expenses:—		
Ploughing,	$1 25	
Harrowing,	75	

Manure, ten loads,	$10 00	
Carting and spreading,	2 00	
Planting with corn-planter, in drills,	75	
Three-fourths of a pound of seed,	75	
Ploughing with small cast steel plough, weighing twenty-five pounds, and thinning,	5 00	
Second time with plough,	2 00	
Harvesting,	6 00	
		$28 50
Net profit,		$58 50

SUNDERLAND, October 26, 1853.

Turnips.—The half acre of turnips which we enter for premium is a sandy loam. The land has been in grass for the last three years. We turned the sward under the 5th of July, after taking off a crop of grass, and cutting the furrows from seven to eight inches deep.

Value of crop:—		
250 bushels at 20 cents,		$50 00
Expenses:—		
Ploughing,	$1 25	
Harrowing,	75	
Eight loads of compost,	6 00	
Carting and spreading,	2 00	
Sowing with corn-planter, in drills,	50	
Half a pound of seed,	34	
Hoeing and thinning,	3 00	
Ploughing with light cast steel plough, weighing twenty-five pounds,	1 75	
Harvesting,	4 00	
		19 59
Net profit,		$30 41

SUNDERLAND, November 5, 1853.

NORFOLK.

From the Report of the Committee.

The cultivation of vegetables in our county is greatly stimulated by our proximity to the metropolis, and the large towns in its vicinity. No branch of husbandry proves so profitable as this, where it is conducted by intelligence and experience. There are many instances in this county of large families raised, educated, provided with patrimonies, vigorous health, and habits of industry, from the operations of vegetable culture. The sales from a dozen acres of highly cultivated land, devoted to garden vegetables, will exceed the income of several large farms cultivated in the ordinary way. The market is never overstocked, and often its deficiencies are supplied from distant States. Success in this calling depends on knowledge; and an apprenticeship to a skilful vegetable gardener is a pursuit worthy the attention of our young men.

JAMES M. ROBBINS, *Chairman.*

Statement of Isaac H. Meserve.

The ground on which I raised carrots this year, and offer for a premium, measured one acre, of a light loamy soil; I spread, last spring, about four cords of compost of hog manure and meadow muck; ploughed it twice; harrowed and sowed on a level surface the 24th of May, with a seed-sower; I weeded them three times; I commenced harvesting the 5th of November; the acre produced eighteen tons.

Expenses:—		
Four cords manure, ...	$16 00	
Ploughing and harrowing, . . .	6 00	
Sowing and seed, ...	2 50	
Weeding, &c., ...	10 00	
Harvesting, &c., ...	7 00	
		$41 50
Value of crop:—		
Eighteen tons carrots, at $12, ...		216 00
Net profit, ...		$174 50

The work was mostly done by the inmates belonging to the institution, but I have charged for their labor about what I think would be the cost.

Brook Farm, November 12, 1853.

This is the fourth year that I have cultivated carrots on the same piece of ground. It has never produced less than fifteen tons to the acre. It is also set to an orchard of apple trees, which are in a flourishing condition. I have spread about the same quantity of manure each year, and the ground is in good condition for a crop of carrots next year. I. H. M.

This is to certify, that I measured off one acre from a piece of carrots on Brook Farm; I also measured six hundred and thirteen baskets from said acre; I weighed three baskets, which averaged fifty-nine pounds to the basket, making eighteen tons one hundred pounds.

Dan T. Boynton.

Statement of Cheever Newhall, Esq., in a letter to the chairman of the committee on farms, of which the latter speaks as follows, in a letter to the president of the society—Hon. Marshall P. Wilder:—

We have here an account of a remarkably profitable cultivation of a few acres of old and poor pasture ground, the knowledge of which may be highly useful and encouraging. Certainly it shows that the farmers of Norfolk County have no reasonable cause for complaint, while, by timely and judicious labor, they may secure a harvest equal in value to many that are gathered from the fertile soils of Ohio or Illinois.

C. C. Sewall.

Dorchester, December 12, 1853.

To the Rev. Charles C. Sewall.

Dear Sir,—In conversation with you, a few days since, relative to a crop of ruta-bagas raised by me, on five acres of land, the present season, I stated the result; since which, I have

received a note from you, soliciting a detailed account of the manner of planting and cultivating them.

The land on which they grew was poor pasture land, and had not been cultivated for more than thirty years. It was ploughed last fall, and again this spring; was well manured, partly with night soil and partly with piggery manure, to which was added a quantity of guano and ground bones,—the cost of the two latter being $6.60 per acre. The potatoes grew well, and yielded a fair crop; were dug early, and sent to market. In digging the potatoes, *the tops* were laid regularly between the rows; at the same time care was taken to haul the earth over them, which made somewhat of a ridge. These ridges were three feet apart. The ruta-baga seed was dropped upon them, nine inches apart, at several times between July 27th and August 10th. No plough was used after taking off the crop of potatoes. At least one-tenth of the spaces intended for the ruta-bagas was vacant, as the seed did not vegetate. About ten days after the plants were up, the cultivator was passed between the rows; the plants were thinned out, leaving but one in a space, and thoroughly weeded. This is all the cultivation they received. About the 20th of October, the entire crop on the five acres was sold for *one hundred and fifty dollars*—the purchaser to take them from the ground, where they then were.

The person who bought them says that the produce was more than twelve hundred bushels, and that they were well worth the sum he paid for them. When it is considered that this crop was raised upon land that had produced a fair yield of potatoes, and that *thirty dollars per acre* was realized for a *second crop*, while the expense did not exceed five dollars per acre, I am led to believe that land will sometimes, at least, pay the cultivator a fair compensation for the labor bestowed.

With much esteem,

Your obedient servant,

CHEEVER NEWHALL.

PLYMOUTH.

Statement of Seth Sprague.

Onions.—The quarter of an acre of land on which were grown the onions entered by me for premium, was cropped with onions the last year. I spread thereon five and a half tons of kelp or sea-weed, which was ploughed under eight inches deep. The last week in April, spread six cart-loads of good, fine compost manure. The lot was then harrowed several times, and hand-raked; and the first week in May, planted with the improved Danvers Silverskin, with a seed-sower, in rows, fourteen inches apart. The land is a moist, not wet, black loam. The ground proved weedy, which gave us much trouble; the rows being close together, increased the labor of cultivation. The crop was harvested between the 10th and 20th instant, and measured one hundred and ninety-two bushels. Expense of cultivation, exclusive of manure, $22.50.

Duxbury, September, 1853.

Statement of George Drew.

Ruta-Bagas.—The land on which I planted one-quarter of an acre of French turnips, the present season, was planted to corn in 1852. In April, 1853, I ploughed and harrowed it; the second week in June, I carted on two cords of barn manure, ploughed it in, and harrowed it. In about a week after, I ploughed it again, lightly spread on thirty-eight bushels of ashes, and harrowed it. On the 24th and 25th of the same month, I planted it. I dug holes for the hills, with a hoe, two feet one way, and twenty inches the other; put in a small spoonful of plaster, dropped the seed by hand, and covered it with a hoe.

Expenses:—

Ploughing three times, and harrowing, carting on manure and ashes, ...	$4 00
Planting, ...	2 50
Forty-eight bushels of ashes, at 12 cents, . . .	5 76
One hundred pounds of plaster, ...	50

Hoeing, twice, ...	$5 00
Harvesting, which is not done, estimated, . . .	2 50
	$20 26

October 21st, I harvested one average rod of the turnips, which weighed two hundred and thirty-six pounds, making $674\frac{16}{56}$ bushels.

Statement of Seth Sprague.

Carrots.—The quarter of an acre of land entered by me for premium on carrots, is a sandy loam, and was in carrots last year. I spread six ox-cart loads of stable manure, ploughed eight inches deep; spread one hundred pounds Peruvian guano, prepared with thirty bushels of peat or swamp mud, which was well harrowed in; hand-raked, and planted with a seed-sower the first week in May, with the Orange carrot, in rows, fourteen inches apart; thinned at weeding to four and six inches in the rows. On the 22d instant, dug one square rod, a fair average of the field, which weighed three hundred and eighteen pounds, which, at fifty-six pounds to the bushel, is two hundred and twenty-seven bushels—nine hundred and eight bushels to the acre.

The expense of cultivating, exclusive of the guano and manure, was twenty dollars, perhaps something more; as weeds were plenty and vigorous, we bestowed extra labor.

Beets.—The quarter of an acre of land of beets, entered by me for a premium, is a sandy loam, moist but not wet; was cropped with beets last year. Spread six cart-loads stable manure, ploughed it about eight inches deep. It was subsoiled last year. I spread one hundred pounds Peruvian guano, prepared with thirty bushels peat or swamp mud, which was well harrowed in; hand-raked, and planted with a seed-sower, the first week in May, with mangel wurzel, in rows two feet apart, and thinned to one foot in the rows. On the 22d inst. selected one square rod, in two places; gathered and weighed the product, three hundred and twelve bushels and a half to the quarter acre, or one thousand two hundred and fifty bushels to the acre. The growth was vigorous in the early part of

the season, which did not seem to hold out to the end. In using guano on soil not wet and close, I should prefer to bury it with the plough; four or six inches, or even deeper, where the soil is not too loose and sandy, would be better than laying it on the top of the ground Guano is a powerful stimulant to most, if not all, plants; it yields its strength, ammonia, quickly; and if not buried or in some way absorbed, it is lost in the atmosphere. On my beets and carrots it evidently forced a heavy growth of leaves, but did not fully carry out its promise in the harvest. I am not satisfied with the trial. I intend making more careful experiments next year. It seems doubtful whether farmers can afford to use it for ordinary purposes. We need experience, which is the only real test. We must see and realize its effects on our crops, to induce us to pay fifty dollars per ton for it.

The expense in cultivating a quarter of an acre of beets, is about twenty dollars, exclusive of the manure, rent of land, &c. If the cultivation is easy, and few weeds, it may be a little less; if hard and weedy, something more.

Duxbury, September, 1853.

BARNSTABLE.

Statement of Joshua Crowell.

Carrots.—May 3d, planted one-fourth acre on a soil mixed with clay and loam. Land was bought in 1843, at $23 per acre; for three years planted with potatoes, and manured principally with sea-weed; in 1846, seeded down to grass; again broken up in 1852, and planted with carrots, but the crop was light, not more than three hundred and sixty bushels per acre. Last year, manured with twelve horse-loads of barnyard manure, and the same this year. Carrots raised on the quarter of an acre weighed ten thousand and seventy-three pounds. They were planted in drills, two feet apart.

Value of the crop thus raised, five tons, at $9 per ton, ...	$45 00
Cost of manure, cultivation, and harvesting, . .	20 33
Profits on one-fourth of an acre, . . .	$24 67

CRANBERRIES.

The following communication has been received in addition to the statement given below:—

C. L. Flint, Esq., Secretary, &c.

Dear Sir:—My attention was first called to the subject by a gentleman from Natick, who stated to me that the best cranberry meadows in that vicinity were worth from $1,000 to $1,300 per acre, which struck me with some astonishment. I then looked at my own swamps, and could see no good reason why they could not be made as good cranberry-meadow as any other, and accordingly went to work and built a dam to flow the swamp to kill the bushes. After flowing three years, I took off the water, and set from one to one and a half acres with cranberry vines; this was done in 1846. We found at that time a few beds of native vines, which have spread to be equal to one-fourth or one-third of the transplanted. The cost of the whole operation, we think, could not have exceeded $50. And now for the proceeds:—

In the year 1851, our crop sold for $70; in 1852, for $300; in 1853, for $380.

I have no doubt but there is swamp land enough in Massachusetts, suitable for raising cranberries, to raise enough, at the prices they have brought for the last two years, to come to more than all the corn, grain and apples raised in Massachusetts. I will here add the remarks of two gentlemen in regard to glutting the market with the article; the first a city man, who said, the inhabitants of Boston and New York have not' as yet, begun to get the taste of cranberries. The second, a farmer and nurseryman, who said, if I had ten acres, and you had ten acres, and every man between you and me, and every man between you and Canada line had ten acres each, and they all bore two hundred bushels to the acre, it would not glut the market.

Yours, respectfully,

ADDISON FLINT.

NORTH READING, February 9, 1854.

MIDDLESEX.

Statement of Addison Flint.

In the autumn of 1843, I built a dam, and flowed the swamp from that time till August, 1846; then let off the water.

The following October, burnt over the swamp and set the vines. The vines were cut up with a sharp hoe or shovel, and set in hills, three and one-half feet apart; the bunches about the size of a quart measure.

In raising from the seed, I planted in October, 1846, about half an acre; crushing each berry between the thumb and finger, and placing it just under the mud; single berries in a hill, three and a half feet apart. Also, sowed broadcast a number of bushels of refuse cranberries the following spring. Very few vines appeared from them for two or three years; no berries till 1852, then very small; in 1853, good size, in quantity, worth picking.

My practice has been to stop the water in October, and keep it on till May, or until the weather is warm enough to start vegetation—then lower it down to the top of the vines, and keep it on them until I think the spring frosts are over, then let the vines be fairly out of water until the berries are grown, —say from 10th to 15th August,—then draw it off for ripening and picking.

We found three or four small beds of native vines on the swamp, after we let off the water to set the vines, and a few very fine berries; there is now probably a dozen beds that bear berries.

In 1850, we picked seventeen bushels of berries on the swamp; in 1851, twenty-eight bushels; in 1852, ninety-three bushels; in 1853, we estimated them at one hundred and fifty bushels.

In 1852, the native vines produced, by estimation, before selling, forty bushels; the transplanted vines, sixty bushels; the increase this year is, principally, from the transplanted vines.

North Reading, October 1, 1853.

Statement of Augustus H. Leland.

The piece of cranberry meadow to which I invite your attention, contains about three-quarters of an acre. The mud and peat is deep, varying from three to seven feet. The soil is black mud which lies on the peat, and the peat rests on a light layer of sand, and under that, as near as I could ascertain at one point, a clayey gravel. There were four or more kinds of grass upon this piece which had been cut off yearly ever since my remembrance.

The first of these grasses is called *carex filiformis*, a kind of sedge grass, which passes by the name of water-grass—grew upon the greater portion of this piece. Another kind is the *carex stricta*, a kind of sedge grass, called hassock-grass; and also, the narrow-leaved sword-grass. The third kind, *carex lacustris*, a kind of sedge grass, with broad leaf, and is called broad-leaved sword-grass. The fourth kind is *scirpus eriophorum*, the true name being wool-grass, called the broad-leaved sword-grass and also broad-grass. These grasses I shall allude to in my experience which will be annexed to this statement.

In the autumn of the year 1838, I think, with a cast-iron shovel ground sharp and put in good cutting order, I removed squares or sods of the turf from the ground, one side of these squares nearly corresponding in length to the width of the shovel, the depth of the hole being from four to five inches. I then, from beds of vines, cut sods of vines corresponding in size and in depth to that which I had removed, which I placed in the holes already made, and with the feet trod or pressed them firmly into the hole, that they might not be disturbed by the action of the ice or water, during the winter or spring. The distance of these sods, or hills, one from another, was from three and a half to four feet. As some of these vines which I transplanted had grown from fifteen to eighteen inches in length and lay nearly level with the ground, care was taken to raise the vines, and place the shovel under so as not to cut off the vines and also to get a sod of the proper size, otherwise the

vines would be cut off and greatly injured. As far as I have seen, vines, which are of much length, and which lay under water during the winter and spring, will, if let alone, naturally lean to the north-east, (for the same reason that fruit trees lean that way,) and as I rake my vines all one way, that is, I draw the rake from the south-west to the north-east, so I placed those sods of vines which did not stand erect so that they would lean to the north-east.

Every year since the year 1840, these vines were eaten up as regularly as the year came round, by a worm called in this vicinity the cranberry-worm. This worm may be the same, or at least, a species of the same worm, which operated the last of June on the apple tree; its appearance to the eye is the same, its operations the same, and it has the same faculty of jerking itself back as the apple tree worm. Some seasons they seemed to threaten total annihilation, the vines presenting to the eye the same appearance that an orchard does when its foliage has been eaten by the canker-worm. To destroy this worm the vines were kept under water from spring until the first of July, 1852. This destroyed all the worms, I believe, as I have not seen one since. When the water was taken off, the vines grew vigorously, forming the blossom bud for the present year, and the result is as handsome a lot of berries as ever was seen.

Nearly every year I have cut the grass near the first of July, thereby giving the plants the air, sun, and light.

One side of this piece borders upon a small brook, which, previous to my cultivating the vine, in a dry time would become dry. In this brook I formed a dam in two places; these dams, most of the time in a season like this, keep the meadow wet, and the water is forced back among the vines, the object of which is to protect them from frosts, which usually occur in all the summer months in low lands.

In addition to the above statement, I would like to give my experience in the cultivation of the cranberry; I would do it with the hope that by my efforts and experience, whether successful or otherwise, those who would try the experiment may be encouraged and emboldened to persevere in the cultivation

of this delicious fruit, and which promises the cultivator so great a reward.

It is more than twenty years since I entered upon the cultivation of the vine with high hopes, believing that the cranberry was a hard thing to exterminate, that it would destroy grass in all situations and in all soils, and cause even hassocks to disappear. And after a trial and many years of observation, I find the cranberry a hard plant to destroy, except with the plough, and that it will not root out and destroy all grasses in all situations and soils. I find that in some soils the vine will not drive out certain kinds of grasses when in other soils, it may succeed. Take, for instance, that kind of sedge grass which we call hassock-grass—this upon banks of streams, and in our swales where it is more or less wet, roots with such strong hold, and throws up the blades of grass so thickly, that there is no room for the vine in a soil less rich, and the vine will in all probability succeed.

Take, for instance, the *osmunda spectabilis*, called in this vicinity buckthorn, and known to botanists by the name of flowering fern. This grows in the form of a tree, its slender stem supporting a large top with a large leaf, overshadowing all around, and shutting out the sun, light and air so much that the vine cannot grow. On one occasion I set out vines among the flowering fern, and in about three or four years the sods of vines could not be found. Close by the side of this was a large bed of vines covering nearly a quarter of an acre of ground, except four or five little places, of a few yards in each, which was flowering fern, or buckthorn. In order that the ground might be comparatively covered with vines, I cut up and carted this buckthorn to the upland, and set sods of vines in its place, expecting that they would some day take the place of the buckthorn. In this I have not been disappointed, for these plats are loaded with the largest fruit; so thickly do the berries lay this day, that, in some places, they would, if collected and laid upon a level place, completely cover the ground. But this quarter of an acre of vines in a few years was gone, except a few stray runners; the flowering fern had taken their place, and the plats I set out are only left to tell where the original bed of vines stood. Now I do not suppose that in

every situation and kind of soil this fern would supplant the vine, although in this case it did. I have several small plats of ground besides, one containing some fifty square rods, the turf containing the roots of the buckthorn. I cut in strips about fifteen inches wide and set it up edge-wise to dry. These were burnt when dry, and the ashes carried to the compost heap, as they are not needed on this soil.

These plats were set with sods, with most excellent success; one-half rod gave me this season one bushel of berries, which is at the rate of at least three hundred and twenty bushels to the acre. These experiments show clearly that the plant cannot be set in this grass with any prospect of success. There is another kind of grass called polly pod, also small brake, *dryopteris thelypteris*, which, as far as I have seen where it covers the ground, casts so much shade that the vine cannot succeed in it. It is more easily pulled up than the buckthorn; and when dried and burned, vines may be set with good results.

There is another kind called by some the broad-leaved sword-grass, and by others broad-grass, and by botanists *wool-grass, scirpus eriophorum*. It grows in round plats or clumps, varying in diameter from three feet to twelve feet. In the piece I presented to you for examination there are several plats of this grass which show that the vine cannot take root in it.

Upon this same piece of ground is another kind of grass covering some two rods called *carex lacustris*, a coarse kind of sedge grass; its general appearance does not differ from wool-grass, the blades of which are not so thickly set in the soil as the wool-grass, yet so much so that the vine succeeds with difficulty.

The other kind of grass in this piece is called *carex filiformis*, a kind of sedge grass and water grass. This grows in wet places, throwing a less number of blades which cast less shade, and when mown there is less stubble than any other kind of grass I have noticed. On the whole, the vines have flourished quite as well in this as in any other grass, although my success has been equally good on one piece of hassock and sedge grass.

On another plat which was covered with hassocks I set sods between them which have nearly disappeared, the hassocks

standing alone in their glory. I would recommend that all hassocks be removed before setting out vines. And also, let no man set out rose-bushes with his vines.

I would suggest that when the thermometer, the direction of the wind, &c., denote a frost, if there be a stream of water which the cultivator can command, that a dam be built and so constructed that the water may be thrown back during a cold spell, and when it is past let the water run again. If a stream of water of sufficient size does not flow—reservoirs of water may in places be laid up for use in a frosty time.

As far as my observation extends there are but few soils in which the cranberry will not flourish. Where it will not, the character of the soil may be changed by carting on gravel, loam or sand, at any time in winter; if necessary spread it upon the ice from one to three inches in depth; the vines will find their way through and grow with new life and vigor.

I have in two instances made trial of burning the vines because they were old and did not seem to bear fruit. These pieces contained together some ten to fifteen rods.

I can see no good reason for burning vines except to destroy the cranberry worm when it cannot be done by flowing in summer. If burning is resorted to great care must be taken not to burn in too dry a time. If there be but few vines and other matter to burn, it would be necessary to select a time more dry than if there were a great body of vines—as they would burn almost any time when once on fire.

Meadows for cranberries must not be drained.

Above is my statement, and also my experience, and I rest my claim for the premium on three reasons.

1. The successful experiment in transplanting.

2. In establishing the principle that flowing until the first of July will destroy effectually the cranberry worm, so destructive to the vine.

And, lastly, yet by no means the least, my experience and observation of more than twenty years in the cultivation of the vine in the different grasses, which may, by being given to the public, save those who cultivate this fruit much precious time as well as large sums of money.

SHERBORN, September 13, 1853.

PLYMOUTH.

From the Report of the Committee on Improvements.

The premiums "for the greatest quantity of cultivated cranberry vines on not less than an acre of land, which shall be in the most flourishing condition in September, 1853," were claimed, severally, by Thomas H. Samson, of Pembroke, Austin J. Roberts, of Lakeville, and Paul Hathaway, of Middleboro'.

Mr. Samson having succeeded, with great labor, in clearing the brush and larger wood from two pieces of low, moist swamp land—a deep vegetable soil; and having pared and removed the turf and tussock stools from their surface, proceeded to set his plants. This was done in different years, commencing in the spring of 1846, and ending in the fall of 1852. It consisted in placing small square sods containing them, cut from a bog meadow, in holes dug for their reception, at short distances apart, and then drawing soil around in such manner as to secure the sods, with their contents, in their new position. This labor seems to have been performed without any view to subjecting the plants to any subsequent course of culture, which they appear not to have received.

Of these two pieces of land, one exhibits the plants, more especially, in different stages of their growth; some having been recently set out, looking puny and feeble, and showing scarcely any runners; others of older date, looking stronger, with runners more numerously thrown out and extended. But of the larger part of this, and that of all the other plat, the vines cover the surface with a mass of net work, although they do not constitute the exclusive growth, appearing in a most healthy and highly vigorous state, and bearing—a spectacle gratifying to any one to witness, but peculiarly gratifying, it may be supposed, to the proprietor—a most luxuriant crop of sound, bright and sparkling fruit.

Actively engaged, as Mr. Roberts appears to have been, for several years past, in adorning and improving his ample homestead, a work in which he has displayed much horticultural taste and agricultural science and skill, he has yet found some time to devote to the culture of the cranberry. The tract

selected by him for this purpose lies nearly at the foot of a slope, descending in a westerly direction, and but a short distance from his mansion, pleasantly situated within view of portions of the bright and flashing waters of two of the neighboring lakes, gracefully fringed with their sylvan borders, and strongly tempting the angler's skill. The place, for an upland site, was not ill chosen. It is a fine sandy loam, apparently of good depth, and in good condition. The open and friable texture of the soil offers every facility for the free and unimpeded extension of the rootlets and tissues of the plants, and the rains falling on its surface, together with the wash from the adjoining high ground, afford (or have done the past season at least, and may do so again) a copious supply of moisture, and with it, probably, no inconsiderable amount of other nutritious matter. The sward having been turned over with the plough and harrowed, the plants, procured, as were those of Mr. Samson, from a fresh meadow, were introduced into shallow furrows running lengthwise of the lot, and set nearly three feet apart each way. The grass and weeds were carefully kept down for two years, when the further task of clean cultivation was abandoned, as, if not impracticable without clipping the runners, involving too great an expense to make the culture a remunerating business. Hence, the plants were left to take care of themselves, and to struggle for supremacy, as they might be able, with the natural products of the soil. This conflict, the foregoing favorable circumstances have been of essential service in helping them to maintain; those circumstances have had the effect of producing, for the most part, thrifty looking vines, showing, in places, a goodly yield of large, sound, and handsome berries. As compared, however, with those of Mr. Samson, one square rod of which produced, as I should have before mentioned, six and one-quarter pecks of berries, being at the rate of two hundred and fifty bushels to the acre, Mr. Roberts' vines appeared to be less vigorous and productive; and much less free from grass and other unwelcome products. On visiting Mr. Hathaway's field (a "sandy loam," as he describes it) his cranberry vines, it was found, were scarcely visible amid the thick coat of grasses that encumbered them, and generally covered the ground, and which no apparent effort had been

made to eradicate. Against these grasses, however, in a soil that it loves, the cranberry, fairly introduced, would probably be able to hold on, and even succeed in maintaining with them, at least, a divided empire. But there appeared to be, in this case, another enemy to contend with, in the shape of vulgar, unsightly bushes, which, having gained a foothold at different points, seemed to bid fair to make the contest one of fearful odds against the former, and ultimately to win the field. Mr. Hathaway, it must be admitted, has succeeded in raising this fruit, but his experiment at present seems not to be one of a very promising character. This is not strange, for it is hardly to be expected that one whose life is deeply "in the yellow leaf," would be able to attain success in a laborious enterprise, which the strength and energy of his greenest and freshest manhood could not have been more than adequate to secure.

The foregoing experiments having been conducted upon the same scale of dimensions, one acre of land, the statements and observations already made with regard to the method pursued, and the results attained by the several competitors, may be sufficient to indicate the relative degree of their respective merits. There remains, however, one other point to be settled.

The premiums claimed are proposed for the greatest quantity, on not less than an acre of land, of the most flourishing "*cultivated* cranberry vines." What, then, are "cultivated cranberry vines," within the meaning of the trustees, as here expressed? In what would seem to be the more appropriate and restricted signification of the terms, they are such as are in the course of being nurtured and cherished by some annual process or processes of manipulation; by hand labor, that is, in some form, being bestowed upon them, as in stirring the soil, shortening in the runners, &c., and by the occasional administration of some description of fertilizer. Applied to the cranberry in this sense, the term "cultivated" is what it is generally understood to be when applied to the strawberry, and nothing more or less. Holding such to be the meaning designed to be conveyed by the language used, no competitor would be entitled to any award, as no competitor has shown any cranberry vines, or made any statement with respect to any of a description fairly and properly comprehended within such meaning.

But in a wider and more popular sense, cultivated cranberry vines are those upon which only the labor of transplanting from the fresh meadow has been bestowed, no less than those under a course of treatment similar to that above described.

As the subject to some is not without interest, permit me, in conclusion, to suggest what would seem to be a good mode of raising the cranberry. It is this: Select for the purpose a deep vegetable soil, pare and remove the turf from its surface, dress, if practicable, with fine sand, (not soil) or some better material; set the plants, giving them fair working distance, and then, for the space of two or three years, use all diligence to help them to hold and occupy, not, in any sense, as commoners or copartners with other products, but as sole tenants, which they will not be backward in seeking to become. I will only add, that if the waters of any small stream near at hand can be so controlled as to throw a thin sheet over the surface, during winter, and occasionally, perhaps, for a brief while, at other times, to refresh and invigorate its occupants, and prevent injury from frost, which sometimes happens, it would be a desideratum, connected with the object in view, of much importance.

JOHN E. HOWARD, *Supervisor.*

Statement of Thomas H. Samson.

Having entered my claim for "the greatest quantity of cultivated cranberry vines on not less than an acre of land," I beg leave to present the subjoined "particular account of my several operations."

In the summer of 1845, I commenced preparing about half an acre of swamp land for the cultivation of cranberries; it was completely covered with whortleberry bushes and alders; these were removed to the upland, and the tussocks and the top of the soil were removed, and early in the spring of 1846, I set out about one-fourth of the lot with cranberry vines, without any dressing. In the spring of 1847, I set out about the same quantity, and about the same in 1848, a part of which was dressed with gravel and soil. In the spring of 1849, I completed the half acre, covering the last with a dressing of gravel

and soil, about one inch in thickness. In the month of June, 1849, I sowed a bushel of cranberries over the whole lot, first crushing them and mixing them with sand, in order to sow more evenly.

The vines soon covered the ground, and have produced a good quantity of fruit for four or five years. In the summer of 1850, I commenced preparing the other half acre, on the easterly side of the highway, removing the wood and bushes, taking the tussocks and soil off, &c. In the fall of 1850, I set out cranberry vines on about one-half of this lot. It was so wet in the fall of 1851, that I could not finish it. In the fall of 1852, I completed the work, dressing about one-half with sand and gravel, about the same quantity as on the first lot.

I can discover no beneficial effects from the dressing with sand or gravel, and think it rather encourages the growth of grass. I find my vines do the best where the peat or mud are the deepest.

The first half of this lot set out, are in bearing condition, and have borne fruit two years; the other half are now doing well.

On the 10th instant, I gathered from one rod of the vines, set in 1850, one bushel and a half and two quarts of cranberries.

In the spring of 1852, I tried the following experiment to test the practicability of raising cranberries on a dry, gravelly soil. I first removed the sod from one square rod, and sowed cranberry seed in the same manner as we do carrots; the seed vegetated, but they do not promise very fair to remunerate me for my labor, and I have little faith in raising cranberries on dry soil.

I would state that I flow my cranberry meadows from October to April.

Statement of Austin J. Roberts.

The increasing demand and consequent high and remunerating prices for the cranberry, have led me to experiment on its adaptation to the light loams of our county. A boggy or very moist soil has generally been deemed indispensable to the

profitable cultivation of the cranberry, for the reason of its being the natural soil—that wherein nature placed it; and as nature rarely errs, it has been taken for granted that it was not misplaced.

In the fall of 1847, I noticed that the cranberries on a certain low, swampy soil, were much benefited by the sand washed from an adjoining hill. In size, the berries were larger, and the yield there was more abundant, compared with the product of the vines further in the swamp, where the sand had not reached. This led me to the determination to ascertain how far the cultivation of the cranberry on a sandy loam might profitably be carried. Accordingly, in November, 1848, I commenced setting out about an acre of land to cranberry vines.

The piece of land in question, had a gentle slope to the west; the upper portion was very light and porous, and so poor that it had, in previous years, been considered hardly worthy of cultivation. The middle part, comprising one-third of the piece, was good, light, loamy soil, not liable to bake, or suffer from drought. The third portion of the lower part was strong loam, inclined to moisture, and may be termed good grass land. Thus, this acre of land embraced soils of three different textures, and was purposely chosen to notice the effect of soil on the vines. The way of planting was as follows: The land was ploughed eight inches deep and harrowed; light furrows, three and a half feet apart, were then run lengthwise; cranberry sods, of the Bell variety, were cut eight to ten inches square, with a sharp spade, wheeled out of the swamp, carted on the upland, and deposited in the furrows three feet apart, although two feet would have been better, so that the sods, as placed in the furrows, were three and a half by three feet apart. Clean cultivation was, for the next two years, carried on by the cultivator and the hoe. The third year, the vines had commenced extending themselves in all directions, and at the end of the season had, in many places, nearly covered the ground. Runners, from three to four feet in length, were thrown out with great luxuriance, rendering the cultivator and hoe of no further use in keeping down the grass and weeds. Fingering (cleaning by hand) an acre of cranberries was now out of the question, so that weeds, grass, and cranberries were

left to conflict for the mastery. During the drought of 1852, the cranberry vines on the upper or dryest part of the land, began to fail, evidently suffering from the severity of the drought. On the middle portion, the soil being deep and mellow, they grew finely, overpowering the weeds and grass, and in places, bearing at the rate of half a bushel to the square rod, and apparently not at all affected by the dry weather. In the lowest part, which was the moistest, the grass appeared to gain the ascendancy, and although the vines spread as well as the grass, the yield of cranberries was not more than one-third as great as on the middle portion, owing, doubtless, to the natural tendency of the soil to grass.

This year, (1852,) the vines in the central part overrun the ground, to the exclusion of every thing else, and the yield appears, (October 13,) greater than that of any preceding year, and the fruit far superior in size and color to that raised on swamps. Whether the grass in the lower part will eventually yield to the cranberry, is a matter which time will prove, but which I think is likely.

Salt, at the rate of four bushels to the acre, I would recommend as a preventive for worms, which are so troublesome on light soils. One-tenth of my upland berries were destroyed by the worms or the plum curculio last year, but their ravages, I believe, have ceased, as I have not observed a berry stung this year.

Salt, I believe to be a benefit to the upland cranberry, inasmuch as it attracts the moisture, keeps down the weeds, in a measure, and aids the growth of the vines, to say nothing about the vermin. On a small scale, I have applied, at the rate of fifteen bushels of salt per acre, over the vines in the spring, with impunity. The conclusions to which I arrive, after experimenting with the cranberry five years, are as follows:—

1st. That the cranberry will flourish and yield best on moist sand; that they will grow and produce well on loamy soils, but moderately dry, is an established fact in my own mind, though, as a matter of choice, poor, moist sand would be preferable.

2d. That porous, sandy loams for the cultivation of the cranberry, are unsuitable, and contrary to the nature and require-

ments of the plant. In a wet season, the vines may grow well and throw out vigorous runners, thus deceiving the cultivator, but let a severe drought come, and they will suffer and die. In a moist climate, like that of England, the case might be different; but throughout our country, the profitable cultivation of the cranberry, without moisture, is impracticable.

The art of raising the cranberry consists in the selection of damp, barren sands, (though not necessary,) flowed in winter; if the soil be poor, damp, and loose, the surface is speedily covered by the vines, and little trouble or labor is experienced in subduing the weeds and grass. If the soil be rich, the weeds and grass will obtain the mastery, which can only be obviated by an amount of expense and attention inadequate to the returns.

Varieties.—Three kinds may be enumerated—the Bell, as it is generally called, is the best for transplanting on loamy soils. In its wild state it is often found on the edge of cranberry bogs, working its way towards the upland. In form, the fruit is globular, and larger than the other varieties; I think it a more constant bearer, and on light soils it ripens ten days earlier than on the bogs. The next kind is the pear-shaped variety, a shy bearer, and, with me, unproductive on the upland. It is rather more erect in growth than the Bell variety, and the general size of the fruit is smaller.

The small European variety comes next. Its identity was discovered by Mr. Oakes, on Nantucket. It is not found so generally as the other two varieties; the berries are much smaller, but ripen better on boggy meadows than either of the other kinds. In production, it is a constant bearer, but the size of the berry would not commend itself for general cultivation.*

BARNSTABLE.

Report of the Committee.

Cranberries have not succeeded so well in this county, this year, as in some former years, particularly the last; but as

* This is a distinct species, and not a variety of the American cranberry.—Ed.

there is much more land in cultivation now than ever before, the whole quantity raised will probably equal that of any previous year.

The principal reasons why the yield has been less than in some previous years, are:—

1st. The uncommon fruitfulness of last year over-taxed the vines. For we find that those vines which produced so well then, have yielded but sparingly this year, while those that bore but little last year, have produced the principal part of the present crop. It seems to be well ascertained that the cranberry, like the apple, will not produce large crops two years in succession.

2d. The water being unusually high in the ponds and swamps, did not drain off in season for the fruit to come forward.

3d. As a consequence of the superabundance of moisture, grass and rushes have been more liable to come in, and have been very injurious to the crops in low places.

The committee are of opinion that those swamps which have been laid down to cranberries the last few years have not been raised sufficiently high, and that more fail from this than any other cause.

The committee are sorry to say that only one individual has presented a statement of his experiments in the cultivation of the cranberry—he having reclaimed one-fourth of an acre of beach sand knolls, which was before entirely worthless, from which he presents twenty quarts of very fine fruit taken from one rod.

In conclusion, we would add, that we see no reason why the bad yield this year, should discourage any individual from continuing the cultivation of the cranberry, and of reclaiming swamps and filling up ponds for that purpose. If there is too much water on some lots, and grass and rushes have almost destroyed the fruit, our advice would be, to add a few inches of sand, of the proper quality, reset the vines and hope for better success for the future—for we are fully of the opinion that the raising of cranberries will ever continue to be a very profitable business in this county. All of which is respectfully submitted.

Obed Brooks, Jr., *Chairman.*

THE ROTATION OF CROPS.

BY T. G. HUNTINGTON.

HAMPSHIRE.

I propose to offer a few observations on that part of the science and practice of agriculture, usually understood and embraced by the term, rotation of crops. This is a branch of the profession, in regard to the details of which, there is a great variety of opinion; and, if possible, a still greater variety of practice; although about the thing itself, there is not much room for dispute. It will be as well, therefore, to preface my remarks with a definition of terms.

Rotation of crops, in general, may be defined the producing upon a given piece of land, a series of crops in successive years, without much regard to the nature of the soil, or to the intervals, at which the course is to be repeated. This definition describes well enough our common practice, which we believe, in most instances, to be deficient in method, pernicious in its operation, and unprofitable in its results. A much better definition would be—the art of raising, upon a given lot of land, such a series of crops in successive years and at such intervals, that it shall yield the greatest profit to the producer with the least exhaustion of the soil. It requires, for its most successful application, a knowledge of the soils to be operated upon, a mature experience, sound judgment, and a skilful appliance of means. A judicious rotation of crops, therefore, lies at the very foundation of good field husbandry, and no farmer should be satisfied with himself, until he has put into practice a system suitable to his land and remunerative to his purse. No where, probably, has this branch of agriculture been carried to such perfection as in England, Scotland, and perhaps some of the continental states. A full persuasion of the necessity of improvement in this respect, among our Massachusetts farmers, must be my apology for this essay. I have remarked that our common practice is deficient in method, pernicious in its operation, and unsatisfactory in its results. These are grave charges, it must be confessed. Perhaps, before proceeding further, it

may be well to examine them. For one, I believe a careful investigation of the facts of the case would clearly sustain them. In regard to the first, for instance—a want of method. If we go through the town or county and inquire of the farmers whether they have adopted a regular system of rotation; one that they are confident is best adapted to the soil; or, that varies, so as to accommodate itself to the different kinds of soil the farm may contain—how many of them would answer in the affirmative? Judging from personal observation, and from other sources, I venture to say, not one-fourth part. Many of us are altogether too much influenced by the fluctuations in the price of any article we are accustomed to raise. If, this year, it brings a good price—farewell to all our resolutions to be more methodical, if we have ever formed them. Next year money must be made, and every spare rod of ground that will produce it, is devoted to the profitable crop.

So common is this feeling, that it is matter of every-day observation, that any unusual rise in the price of a staple product, is almost sure to be followed in the course of a year or two by as unnatural a depression; and it affords a most striking proof of our want of method.

Again, if some men are fortunate enough to raise a crop, which has more than answered their expectations; instead of endeavoring to ascertain the causes that produced so favorable a result, in order that it may be applied to other fields, they will require the same land to produce the like again, and so, from year to year, until the resources of the soil are exhausted.

This is one kind of method, it is true. It is methodical severity, and methodical ruin, but it is no economical method. The very stones, if they had a voice, would cry out for a more generous treatment than this.

I should be willing to admit, that the two classes of farmers of whom I have spoken, are intelligent and thoughtful enough to have some general plan; although they are often swayed by circumstances to depart from it. There is another class, however, quite as large, probably, as either of the others, who have no plan whatever; or change their plans as soon almost as they make them; who break up, or seed down, plant or sow, as the humor strikes them. If their fields are a faithful transcript of

their brains, it might puzzle even a phrenologist to locate the bumps of such a tangled intellect.

Thus, it would seem that our system of rotation is no system at all; or nothing that deserves the name; and, moreover, it is pernicious in its operation. Here, again, the appeal must be made to facts, for the truth of the observation. It promotes the growth of one of the most pernicious weeds that infest our soils. We refer to the common sorrel. By far the larger portion of lands laid down to grass, for the first year, instead of filling the eye with the beauty, and the air with the fragrance of a luxuriant crop of clover, exhibit nothing but the dull red hue of the blossoms of this unsightly and useless plant. The enormous production, yearly, of its seeds,—which go directly into the hay and thence into the manure heap and to the field again,—should be enough for the entire condemnation of our present practice, unless the evil should be proved to be without remedy.

And then, such a course can but be unsatisfactory in its results, for there is the unsightly field, there is the almost total loss of one crop; and, in its stead, a full harvest of a deadly weed. What but disappointment and loss can follow.

But, to proceed. Our subject naturally divides itself into two parts, viz.: the kinds of crops to be cultivated, and the order in which they should follow each other, together with the time which should be allotted to the course.

In regard to the first point, general and long-continued usage has decided what crops come within the range of most successful cultivation; and, among them, first on the list stands grass. By universal consent, New England is a grass, rather than a grain growing country. That this is our great staple, any one will acknowledge, after having observed how large a proportion of the land is devoted to this crop. He who has what is called a good grass farm, is considered as possessing one of the first requisites to successful farming, and justly so. For, while the cultivation of the cereals is attended with much labor and some uncertainty,—the grass crop, when the ground is properly prepared, is almost always sure, and the cost of securing it is comparatively light. A very good test of its importance may be observed in the general anxiety felt, when there is danger

of failure of even a part of this most important production. It is plain, then, that in our rotation of crops, great care should be taken to fit the ground to produce grass abundantly, a point on which many of us are too negligent.

Next to grass, comes Indian corn. As a hoed crop, it undoubtedly stands at the head of the list, and should occupy a prominent place in our system. Next follow potatoes, oats, rye, wheat, barley, and broomcorn where the nature of the soil admits. Perhaps no course would include all of these. Experience and observation must decide which can be grown to the most advantage. Doubtless there are other crops, especially of the root kind, which should engage a due share of attention. I have only named some of the most important. Of tobacco I have nothing to say; for though it is thought to be an excellent preparation for some other crops, and, in many instances, vastly profitable, it is my firm belief that the blessings attending its general cultivation, cannot outweigh or compare, even, with its curses, considered either in a moral or economical point of view.

We come, then, to the method of procedure. How shall we conduct our series to the best advantage? Before answering this question in detail, it may be well to name three general principles, which should always be kept in view. First, our rotation must be, as much as possible, suited to the character of the soil. Second, there must be reference to the fitting the land for a good yield of grass. Third, each crop must occupy that place in the course, which will be likely to insure the greatest success in raising it.

To the first of these, we cheerfully acknowledge that due regard is generally paid. We rarely see farmers persist in their attempts to raise crops to which their lands are not naturally suited. The error is, rather, in the other direction. Many times, they think it impossible to do that, which a little more perseverance and skill would enable them to achieve. I might cite, for example, the growing of wheat; which, in this region, not many years since, was thought to be next to impossible; but which is now becoming quite a common crop. The principle embraces both sides of the question; for we ought certainly to be as ready to adopt a profitable crop, which our ground

will produce, as we are careful to avoid those which are unsuitable.

In regard to the preparation of the soil for grass, the common practice is much more faulty. Indeed, I am persuaded that herein lies our chief defect. Our rotation hardly ever comprises more than two cultivated crops; unless an exception is made in favor of the meadows, which are often kept up for a much longer time. These two crops are, generally, corn or potatoes, followed by rye, oats or wheat, with grass seeds. Now, if the object is, as it should be, to induce a good growth of grass, I contend that the means are inadequate to the end. Grass seeds, in order to take well, require a finely pulverized surface, made light and warm with manure, and the old sod should be entirely decomposed or buried. This it is quite impossible to do on ordinary soils in one year and with only two ploughings. The second ploughing brings up the old turf—an inert, sour mass; which, at that particular stage of decomposition, of all others, is the most unfit to afford the nourishment that the plants need. Without making any pretence to actual knowledge, never having had analyzed a piece of sod in this half-rotted condition, I have adopted the following theory, which has at least the merit of agreeing with the facts in the case. All vegetable matter goes through three stages of fermentation, similar to what in liquids are called the vinous, the acetous and the putrid. When a sod is inverted, as by the plough in the first season, it passes through the vinous fermentation. During this period it throws off some gases, which are beneficial to the growing crop. Cold weather arrests the progress of decomposition and it passes into the acetous state. It now very much resembles, in its general character, the muck fresh from the swamp. It will grow most luxuriant crops of sorrel, wild wormwood or smart-weed; but, as for grass, you might about as well expect to raise it upon an African desert as upon land in such a condition. Our cultivated grasses are remarkably sweet. How, then, can we expect these to grow upon a sour or bitter soil? No wonder that we are doomed to disappointment, if we will thus persist in our attempts to contravene the laws of nature. If you ask what is the remedy for the evil, I answer, prolong the course of your rotation until

the vegetable matter in the soil has passed into a putrid, or dissolving state. Then it will be easily taken up and used by the minute spongioles of the grass roots, and so assimilate itself with the plants. But more of this hereafter.

A third general principle mentioned above was, that due regard should be had to the place that each crop occupies in the course. This is a point of some importance. For instance, it has been observed that oats rarely do well, coming the next year after the turf is broken, being liable to blast; probably owing to the peculiar condition of the soil at the time. Corn hardly ever produces well after buckwheat; while, on the other hand, it is well known that potatoes and broomcorn are excellent preparatives for wheat and rye.

I am now prepared to state, affirmatively, what I should consider the proper course to be pursued with a reasonable prospect of success, making no claims, however, to infallibility, but bespeaking a candid consideration. Actual experiment, it may be truly said, is the only sure test of the views presented, and to that ordeal I am willing they should be submitted. Our situation in the Valley of the Connecticut, occasioning, as it does, some peculiarities in our agricultural practice, will lead me to speak of three different systems of rotation, applicable to different soils and localities. I shall begin with meadow lands, meaning by this, of course, arable meadows, or those that are seldom or never flooded. Probably no one crop occupies so much of these lands as broomcorn. This is an important staple with us. The brush generally finds a ready market at a remunerating price, while the seed constitutes a valuable provender, and the crop is not an exhausting one. Its natural home seems to be upon alluvial flats; and here, accordingly, we find it in its greatest perfection. Evidently, then, it must occupy a large space in these localities. At any rate, owing to the natural fertility of the soil and to the ease with which they are tilled, hoed crops of some kind will always occupy a large proportion of our lands. Thus much I am willing to concede; but I maintain, notwithstanding, that there is injury often done in keeping these lands up too long. I have in mind one marked instance, in which a lot had been kept so long under the plough, that a heavy dressing of manure failed to produce what might

be considered an ordinary yield; and this, too, upon land naturally very favorable to the crop. Five or six years are as many as ought to be devoted to hoed crops. Then let wheat, rye or oats follow with grass seeds. After remaining in grass, say three years, it will be again in good condition for the plough. Here is a nine years' course, viz.: five in broomcorn, or other hoed crops; one in rye and three in grass. Let us compare it with nine years of broomcorn alone. I will suppose five hundred fifty pounds to be an average yield, with six loads of manure dropped in the hill. This, for nine years, will amount to four thousand nine hundred fifty pounds; which, at six cents per pound, is two hundred ninety-seven dollars. Estimating seed at fifty-five bushels per acre, we have, for nine years, four hundred ninety-five bushels. This, at twenty-five cents, amounts to one hundred twenty-three dollars seventy-five cents; which, added to the price of the brush, makes four hundred twenty dollars seventy-five cents. Deduct, for tillage and interest, twenty dollars a year for nine years, and we have as a result, two hundred forty dollars seventy-five cents. Now, if we apply fifty-four loads of manure in five years, instead of nine, we may reasonably calculate upon an increase of at least two hundred pounds per acre. Seven hundred and fifty pounds for five years, amounts to three thousand seven hundred and fifty pounds. This, at six cents, amounts to two hundred twenty-five dollars. Estimating seed at seventy-five bushels, we have, for the five years, three hundred seventy-five bushels, which, at twenty-five cents, would be ninety-three dollars twenty-five cents. This, added to the price of the brush, as before, makes three hundred eighteen dollars ninety-five cents. Deduct one hundred dollars for tillage and interest, and there remains two hundred eighteen dollars seventy-five cents; only twenty-two dollars less than would be obtained by the other method, and which a good crop of wheat or rye would of itself cover, leaving the three years of grass as clear gain. Having thus given my views in regard to a rotation of crops upon lands naturally favorable to cultivation, it may be as well to speak of a kind, the very opposite of this, viz.: those lands which, owing to their distance from the homestead, their inaccessibility, or their unfriendliness to cultivation, it is desirable to keep most of the time in grass.

Here, our course will not admit of more than one hoed crop, which should be followed by oats, barley or spring wheat. It should be recollected that in this course the great object is to secure a good growth of grass. In order to this, there should be but one ploughing, and that should be thoroughly done. The manure should be composted, spread upon the surface and harrowed in. The next spring after the first crop has been taken off, if it has been in corn, the stubble should be cut off close to the ground with a bog hoe. Then go over the ground with a heavy ox-cultivator, until the hills are torn up and the whole well pulverized. The ground is now ready for the grain and grass seeds; and, if the cultivation has been what it ought, there will be a reasonable prospect of success in the undertaking. Care should be taken throughout not to disturb the old sod, as the object is to create a fine tilth upon the surface. The other course, of which I am to speak, occupies a middle ground between the two already discussed. This course extends through eight years—four in grass and four in cultivated crops. The first crop, on breaking up the sod, may be either Indian or broomcorn, according to the character of the soil; the next rye or wheat. Oats are not as good, unless they are cut before they are ripe and used as hay; for they are very liable to blast, when sown upon the partially rotted turf. An excellent plan—when it can be readily carried out—is to turn under the stubble, from which the grain is taken, near the latter part of July; and then to sow turnip seed in drills, putting fine compost into the drills; or, when this is not to be had, ashes or guano may be strewed upon the top of the hills before the plants are up, which gives them a vigorous start. Turnips, if they are kept clean, will leave the land in fine condition for the succeeding crop, which may be roots; or, if these are not cultivated, corn again. I have known corn to do remarkably well coming as a third crop; in one instance, producing fifty bushels per acre; and this on land naturally not at all favorable to its production. By the end of this year, if there has been proper cultivation, the land will be ready for grass seed, which may be sown the next spring, in connection with oats or barley.

In all that has been said thus far, I suppose a liberal supply of manure. No good farmer will think of conducting his opera-

tions without it; but a few words in closing, on its proper application, may not be inappropriate. In the last course of which I have been speaking, it is supposed that manure is applied to both of the hoed crops; that is to say, in the first and third year. In both instances it should be ploughed in; because, in the first year, if so applied, it helps materially in the decomposition of the sod, and so promotes the growth of the crop; and, in the third year, if it is buried with the plough, it will be brought to the surface again the next spring, well fitted to be used by the grass seeds. Much of our land pays well for manuring in the hill, in addition to what is ploughed in. All cold lands, especially, need this, in order to give the corn a vigorous start. Ashes and plaster answer well for this purpose, used upon an inverted sward; but if corn is grown as a third crop, it is better to use the compost. In laying down lands to grass, great good would result from the use of ashes, plaster, and perhaps lime.

I close, here, not because the subject is exhausted. My object has been to excite inquiry and improvement in this branch of our profession.

STOCK.

MASSACHUSETTS.

Report of the Trustees.

The sole purpose and object, for some years past, has been the improvement of stock. In the opinion of the trustees of this society, it is desirable that practical farmers should be duly impressed with the importance of raising breeds of neat cattle, with a special object; either for the dairy, for draught, beef, or any other desirable purpose, and that they should be convinced that the given object in each case cannot well be secured, without great care in selecting the finest animals for breeding. While well aware that fine specimens of animals of this description are often found in what is called our native

stock, the trustees think it quite too much to assume that this stock is susceptible of no improvement by the introduction of animals from abroad, belonging to races of high and long established character, and they feel convinced that such improvement has taken place already, by the introduction, at different times, of foreign races; though the improvement may not have been, with respect to horned cattle, very extensive, or very easy to be traced. But when we see how much has been done for our sheep by the introduction of the Spanish Merino, and for swine, both here and elsewhere, by importations from Europe and China, it would be premature to give up all hope of any benefit from the introduction of larger domestic animals from the Old World. At any rate, it cannot be doubted that the importation of fine specimens of neat cattle has produced greater earnestness and circumspection in some districts, at least, in selecting breeding animals from our native races; a practice on which there cannot well be any diversity of opinion, and on which we must, after all, rely principally, for a long time at least, for any extensive improvement in our stock.

The above considerations have never been disregarded by the trustees of this society, but they do not deem it necessary, at present, to speak of anything done in pursuance of them, previous to the year 1845. In that year, the trustees imported several fine animals of the Ayrshire and North Devon breeds, and purchased others imported by Mr. Randall, of New Bedford. In the course of seven years they were enabled to distribute a full-blooded pair of one of these breeds to every county agricultural society, and one pair to the State Reform School. They thought that in no way could the advantages, which might result from the procuring of this stock, be more extensively diffused. They cannot speak with precision of the result, as, notwithstanding the time which has elapsed, no reports have been received from the county societies sufficiently in detail to enable the trustees to determine the success or failure of the experiment in the character of the young stock. In the year 1851, the treasurer, Mr. Motley, went to England for the purpose of selecting a few fine animals of the Jersey (commonly called in this country the Alderney) breed, with authority to expend for that purpose, a sum not exceeding

$2,500. A full report in relation to these animals was made the last year. The stock is still in the care and keeping of Mr. Motley, and too few in number, to warrant the trustees in distributing or disposing of any of them. No evidence has appeared tending to diminish the reputation of this race for singular richness of milk, or to lead the trustees to question their ability to sustain the cold or heat of our climate. The following extract of a report made to the trustees by Mr. Motley, will show his opinion of their value, sustained by facts within his knowledge.

JOHN C. GRAY, *President.*

BENJAMIN GUILD, *Secretary.*

Report of Mr. Motley.

From my monthly reports the trustees have been kept informed of the general health and condition of the animals belonging to the society. I now submit some remarks as to the value of the Jersey breed of cows for general use.

It has been stated that the quantity of milk given by them was so small, that it was not made up by the excellence in quality. From my experience, I am quite satisfied, that even in quantity, they are fully equal to the average of any other breed of cows. I do not presume to say, that they give so large a quantity as some cows at the height of their flow, but that they hold out longer and are more equal through the year. For example, the heifer "Minna," to calve January 24, 1854, is now giving four quarts (beer measure) per day, and all the other cows are giving from six to eight quarts per day. The milkmen are willing to pay more for this milk than for that from common cows, finding that there are people who know the difference between milk that will produce cream, and that which will not, and will pay a much higher price for it. As to quality, no one disputes that the milk from the Jersey cow is infinitely superior to any other. I have been induced to try the experiment of how much butter one cow could make in the year, and thus far, she has exceeded my expectations. From May 18th to November 9th,—being twenty-six weeks,—she has made three hundred and sixteen pounds and seven ounces, being

an average of twelve pounds and three ounces per week, and is now making nine pounds per week. This is an amount which I think has hardly been exceeded for a cow of her age—four years.

In addition to the animals of this breed imported for the society within the last two years, I have imported twelve cows for myself and other individuals, and I believe they have all given entire satisfaction.

Between five and six quarts of their milk will make a pound of butter, on an average, and even less than four quarts, has produced that amount.

Another year will give us an opportunity of testing the value of the half-bloods, and when judicious crosses have been made, I look for some very superior milkers.

West Roxbury, December 10th, 1853.

The following additional particulars have been furnished me by the treasurer of the State Society, in connection with the plates of the animals which appear in this volume.

The Jersey cow, "Countess," was imported by Mr. Thomas Motley, Jr., for the Massachusetts Society for Promoting Agriculture, in May, 1851. She was purchased by him in the Island of Jersey. She is now seven years old. She gives, at her flow, fourteen quarts of milk, per day, and has given twelve pounds of butter, per week, upon pasture alone. March 16, 1853, the milk she gave the preceding week, made six pounds of butter, having dropped her calf more than nine months before.

The Jersey heifer, "Minna," was imported at the same time, for the society. She is now four years old. April 2d, 1853, she calved. April 20th, the milk she gave the preceding week made ten pounds butter. April 27th, one week, twelve and a quarter pounds; feed, plenty of good hay and three quarts corn and cob meal per day. She gave milk to within thirty days of calving the past winter, and never less than three quarts.

The bull "Colonel" was imported at the same time for the Massachusetts Society.

The Jersey cow "Flora" is five years old this spring; im-

ported at the same time by Mr. Motley for himself. From May 18, 1853, to March 8th, 1854, she has made four hundred and sixty-three pounds butter. Until Nov. 14th, she had nothing but what she got in the pasture, with the exception that she had a feed of corn fodder morning and night during part of August, September and October, when the pastures were very much parched up. This winter her feed has been two quarts corn and cob meal; about two pecks carrots per day, and oat straw.

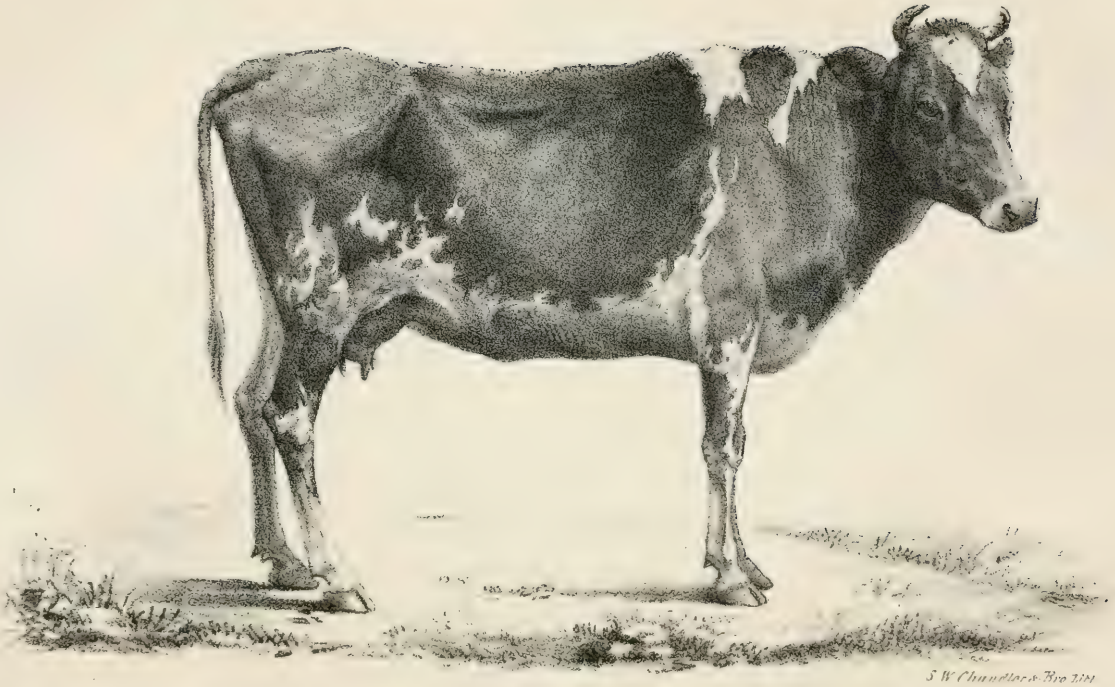
In addition to the above, a manuscript letter of the Hon. Timothy Pickering, addressed to a distinguished farmer of Essex County, has been placed in my hands, and is of such interest, both as throwing light on the earlier importations of the Alderney breed, and as coming from so distinguished a friend of agriculture, that it is given in this connection.

SALEM, October 13th, 1826.

Dear Sir:—As you are to receive the Alderney bull in behalf of the Agricultural Society, I enclose the paper describing his qualities, and those of the Alderney breed, which I gave to Brown, when sent with the bull last summer, among the farmers. I now add further information, from the letter of my friend, Reuben Haines, of Germantown, near Philadelphia, addressed to Judge Peters, who is President of the Philadelphia Society of Agriculture, and which has been lately published in the fifth volume of the Memoirs of that Society. Mr. Haines' letter is dated in October, 1818, and further experience of his Alderney breed enabled him to confirm what he had written in 1818, by a letter to the Pennsylvania Agricultural Society, only two or three years ago. This volume I have seen, but do not possess it. The letter first mentioned is as follows, as addressed to Judge Peters:—

"GERMANTOWN, October 20, 1818.

"With this you will receive a pound of butter, made from the Alderney cow, imported in 1815, and now in my possession. She calved on the 13th of last month, and is now in fine condi-



JERSEY COW FLORA.

Property of Thos. Motley Jr. West Roxbury.

tion, running on excellent pasture of orchard grass and white clover, and gives, on an average, about fourteen quarts of milk per day. From this quantity, during the week ending the 7th instant, we obtained ten quarts of cream, which produced eight pounds and two ounces of butter; and the week succeeding, ten and a half quarts, which gave eight pounds and three-quarters of the quality of the sample sent. You will perceive it is of so rich a yellow, that it might be suspected some foreign coloring matter had been added to it; but you may rely on it this is not the case. I may add, that one of the good properties of this valuable breed of cattle is the ease with which the cream is churned, requiring but a few minutes to convert it into butter.

I remain, &c.,

REUBEN HAINES."

I have been well acquainted with Mr. Haines. He sustains an unblemished character, and his statements may be entirely relied on. * * * * * *

With great regard,

I am your ob't serv't,

T. PICKERING.

The following is the paper referred to:—

To the farmers of Essex:—

As the principal object in keeping cows in this county is to supply the market towns with butter, it was clearly expedient that the farmers should possess themselves of a breed best adapted to furnish that article. Of all breeds known in England, that called the Alderney is acknowledged to be superior to any other for butter, according to their size, or, as the English writers express it—the Alderney cows yield more butter than any other breed, "for their inches." Being satisfied of this, I wrote to Gorham Parsons, Esq., of Brighton, (a native of Essex, and owner of a valuable farm in Byfield,) to know on what terms he would let me have his bull, for a year or more, to send round among the farmers of the county, for

the purpose of improving their dairies by raising calves from their best cows, with this Alderney cross.

On the 31st of October last, I received Mr. Parsons' liberal answer, that, for the object I had mentioned, "I might have the bull so long as I should think him useful, free of any expense whatever." He thinks the Alderney a very valuable breed. After I had decided to take his bull for the use of this county, Mr. Parsons purchased an Alderney bull calf in his neighborhood, at the price of fifty dollars, to serve his heifers the present season.

* * * * * * * * *

The bull has been at my farm, in Wenham, since the beginning of last November, and all the time in fine plight, though fed during the winter on low ground meadow hay. Mr. Parsons having so fed him, and informing me that he required no better keeping; that is, while not put to cows. I shall do myself what I recommend to others—raise all his calves from my best cows. Mr. Parsons, in his letter before mentioned, remarked "that the bull was perfectly gentle;" and so he was found. But to keep any bull gentle, he must be used gently. The tamest, by rough usage, may become ungentle.

T. Pickering.

Salem, May 31, 1826.

This paper was taken about the county by Mr. Brown, who had charge of the bull, and who had directions to stay only about two days at the principal towns, and to give notice to others of his progress.

The crosses produced in this way became distinguished, in particular localities, for the richness of their milk.

The North Devon bull, Earl of Leicester, owned by Nathaniel Dodge, of Sutton, Worcester County, Mass., that took the first prize at one year old, in 1852, also the first prize at two years old, in 1853, was raised by Mr. Dodge, and will be three years old the 29th of May, 1854. Earl of Leicester was sired by full blood bull Roebuck, and out of Beauty, now owned by Mr. Dodge, and formerly from the Patterson stock of North

Devons. Roebuck, the sire of this bull, was sired by Bloomfield, and imported by the Massachusetts State Society in 1846 direct from the Earl of Leicester's celebrated North Devon stock.

Roebuck is now the property of the Massachusetts Society, and was put under the care of the Worcester County Society, and was kept for service at the farm of Harvey Dodge, of Sutton, from 1849, until the spring of 1853. He was considered the strongest blooded as well as best formed bull from that importation. He was not only the getter of Earl of Leicester, but also of the balance of his beautiful North Devon stock, consisting of some twenty-five head, except his last spring calves, which were sired by Earl of Leicester.

The following remarks on the stock of New England, by Hon. J. W. Proctor, are taken from the Essex Transactions:—

What class of cattle is best fitted to the farms of New England, taking into view their cost, their feed, their uses and their products, is the theme proposed for consideration. All will readily admit, that the farmer who expects to live by farming, must keep within the means at his command, in stocking his farm. There is a fitness of proportion in these things that cannot be deviated from, with impunity. The farmer cannot indulge in fancy stocks. He must procure such as *will pay*, and none others.

Massachusetts has ever been under obligations to the adjoining States at the North, for many of the best animals in her stall—especially oxen for labor, and cows for the dairy—the main purposes for which animals are kept on our farms. To be sure, occasionally a pair of cattle, or a cow, is fed for beef, after they have passed their period of usefulness in other departments, but this is not the purpose for which they are kept.

Of the comparative value of our native stock for beef, I do not presume to speak, for in this my experience will not warrant the expression of an opinion. If hearsay is to be credited, I should suppose the Durhams would have the preference, so far as size is taken into view; but whether this size can be attained without a proportionate expenditure for feed, I am not

advised. It is of little use to grow a great calf, when it costs twice his value to feed him. Many such have come to my knowledge.

It is so fashionable, of late, to regard the Durhams, the Devons, the Ayrshires, the Alderneys, and others, with foreign appellations, as the only stock worthy of notice, that the humble animals springing up on our hills, with no pedigree attached, are shoved one side, or are allowed to occupy only the lean-to back of the stable, and to feed upon the crumbs that fall from their betters' table.

I would not be understood as in any manner finding fault with the beautiful animals recently imported, with hair so sleek and forms so symmetrical. I admire their appearance. I am well persuaded much may be learned by tracing their history, and ascertaining the means by which they have been thus perfected. Great credit is due to those careful observers of the laws of nature who have brought about these improvements, and thereby established principles to be applied by others; and to these public spirited citizens who have given us an opportunity to examine and understand them. While all this may be very well for those who can afford it, it is a movement in which the common farmers cannot participate, to any considerable extent at least, because they cannot afford it. Farmers, like others, must cut their garments according to their cloth. What I would say is, let the same care be used in selecting the best specimens of our native breed of animals, and the same expense be applied in feeding them, I am yet to be assured that they will be found inferior to the best imported.

It is not enough that these imported animals have a superiority of mein when first presented; they should be summered and wintered, and pass through the third and fourth generations, before their merits can be fairly tested. Let them be fed at the same table, and with the same fare, from the beginning to the end of the year, and see how they will come out after this. I have seen them, when first brought forward, assuming an air of consequence, not unlike the whiskered dandy from the city, when he passes the ploughboy from the country, arrayed in his frock and trowsers; but when hitched

to the plough, or drained into the pail, this consequential air dwindled into insignificance.

I have witnessed not less than forty ploughing matches, with an average of twenty ox-teams in each; but I do not remember a single instance where any superiority of power was manifested in their operations, by the imported over the native cattle. If they possess the power, would it not have been made apparent under such circumstances? I have known attempts to exclude expert ploughmen from holding the plough, but I never knew of any attempt to exclude expert oxen from drawing it, and if I had, I query whether the slow moulded Durhams would have been thus privileged. I have seen the massive Durhams, the descendants of the far famed Denton, of Northborough, moving in the ploughing field, side by side with the snug-built, bright-eyed native ox from Sutton—a little more than half as large—and was constrained to say, that the work was quite as well done by the latter as the former. If you were about to select your man for promptness and expertness of labor, would you take the largest to be found? By no means. I have seen the snug-built little man, weighing not over one hundred and sixty pounds, who would lay on his back the largest lubber that come along. The same rule applies to oxen for labor.

Our milch cows, for the making of butter and cheese, the primary object for which they are kept on most farms, are certainly not inferior to any others. In expressing this opinion, I take into view their feed as well as their products. I have seen many cows within thirty years, and the very best I have seen have been native. Such was the opinion of Timothy Pickering and John Lowell, gentlemen of as discriminating observation and high character for intelligence and truth as any others. Not speculators in stock—with no prejudices to conquer, or preferences to award. That I may not do injustice to these venerable pioneers in improvements, who did more in Massachusetts to awaken public attention to the interests of the farmer than all others, I beg leave to quote a single sentence from a report submitted by Mr. Lowell, on milch cows, exhibited at the show in Brighton, October, 1822, when Mr.

Pickering was associated with him on the committee; and I myself was present, a stripling, looking on. Says he:—

"Although the milch cows of Great Britain and the Netherlands are in general far superior to our own, I have never seen an imported cow with equal merit with some of our own, that have been here offered. So fully am I convinced of this truth, as well as that our country possesses a very considerable number of these fine cows, that I am persuaded that if Great Britain or the Netherlands were to send us ten cows, selected, each of the best quality there to be found, New England alone would furnish twenty that would equal them in the quantity of milk, butter and cheese they would respectively produce."*

This was not a shot at random, by those who did not know what they were aiming at; but it was said by those who knew what they were saying, in a manner most deliberate, and who stood ready to maintain what they had asserted. Let those who have had more experience, and who possess more wisdom, than did these gentlemen, (one of whom was eighty, and the other about seventy at this time,) come forth and declare it. I beg leave to refer also to the discussion carried on between Messrs. Pickering, of Salem, and Powell, of Philadelphia, published in the New England Farmer, in 1825, where the arguments on both sides of this subject are fully drawn out, according to the light then existing, and I think if doubts remain on the minds of any, the perusal of those papers will remove them. I remember to have read them since with much instruction.

Where can there be found an animal excelling the Oakes cow for butter making properties? I confess I have a local pride in sustaining the reputation of this animal. She was first brought into notice in the humble town in which I reside. She was a small-sized, ordinary looking cow, with a small head and neck, straight back, and broad hind parts, with milk vessels of

* It will be noticed that the writer of this paragraph admits every thing for which the friends of improvement contend, that "*the milch cows of Great Britain, &c., are in general superior, &c.* No one would deny that occasionally we find a "native" equal, and perhaps superior, to most full bloods, yet these are *accidental cases*, and do not produce their like, as is the case with strongly marked breeds. When our "natives" are *in general* equal to the races which have been built up by a long course of judicious treatment, we can with justice recommend them as superior to all others.—Ed.

best form and capacity. She was taken, when about two years old, by a farmer in Danvers, from a drove on its way from Maine to Brighton, without any certificate of pedigree, as many have been taken, and proving to be a good milker, was sold to his brother Oakes, a shoe manufacturer, to afford milk for his family. Her extraordinary butter-making qualities coming to the knowledge of E. H. Derby, Esq., one of the trustees of the Massachusetts Society, he requested Mr. Oakes to take account of what she did. This was done in the year 1816—when, from May 17th, (when her calf was killed,) to the 20th of December next following, she yielded sixteen pounds of butter a week, on an average, besides one quart of milk a day for the use of the family. Of the truth of this statement there is not a shadow of doubt. But it may be said she was high fed, or she never could have done this. So be it. Can it be expected of any animal to create such a produce out of nothing? Suppose a cow to yield twenty quarts of milk a day through the year, how much would be the weight of the milk? If I figure right, 15,600 pounds, or nearly eight tons. Can this be expected of a cow without something to feed on? But the Oakes cow does not stand alone. Several others, in the County of Essex, have come to my knowledge, that yielded from seventeen to twenty pounds of butter a week, for several weeks together; but none so large a quantity, for so long a time, as the Oakes cow. These were all natives.*

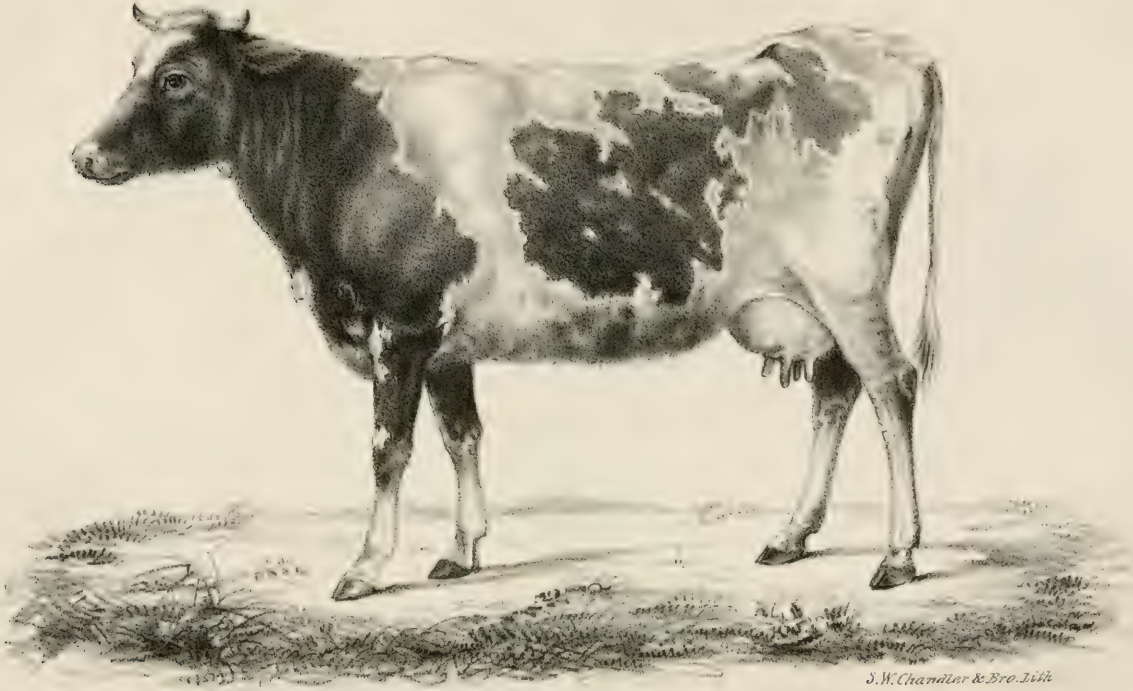
Until well authenticated accounts of better products can be had, I will not yield the claim of our native stock for their butter-making qualities, to any class of horns whatever. That the Jersey cattle afford superior milk, which will yield more butter from the same quantity, I readily admit; but that they are better stock for dairy purposes, taking into view quantity and quality of milk, and expense of feed, remains to be proved. Until proved I must beg leave to doubt.

* The Oakes cow was bought from a drove which came from the regions of the Kennebeck, where many full bloods had been imported. It is not known how much of this foreign blood she possessed, if any. She had the straight back of the Durham. It is well known that, when making so much butter, she drank all her own milk, (skimmed,) and a bushel of meal per week mixed with it. By this unnatural and injudicious treatment she was ruined. None of her offspring were equal in any degree to herself. The celebrated Gore breed came from the same vicinity about the same time.—Ed.

Without doubt, benefit may accrue from crossing the best of imported animals with the best of our own. This was recommended by Messrs. Pickering and Lowell, before named; and this has been recommended by all intelligent men who have given attention to the subject. This has been attempted by the Massachusetts Society for the Promotion of Agriculture. At great expense they have imported animals, selected with the best of care for this purpose. They have generously placed them in the different counties of the Commonwealth, and called on the farmers to take advantage of their offers. From some of the counties they have had favorable returns, Worcester in particular, but generally not so. In Essex, I remember, we were favored with the offer of a bull. After deliberation by the trustees, they concluded to take an Ayrshire animal, and appointed two of their most experienced men from the best stock raising towns, Andover and Newbury, to select him. He was received with all thankfulness—kept at an expense of about two dollars a week—stationed in different towns, and advertised in the Gazette, for a period of two years, and finally died and was buried without ceremony. You may ask what was the result of all this? According to the best information I can obtain, some of his progeny were fair looking animals, but, as a whole, the value of all that remain, distinctly marked as his descendants, would not pay the expense of his keeping.* The inference must be, that the farmers did not think much of the animal, or that he was not worth keeping. I speak of this animal, because I happened to know his entire history; like unfavorable accounts I have heard from other counties. Although thousands of dollars have been expended by the Massachusetts Society, in introducing and spreading abroad foreign animals, I have great doubts whether any benefits have resulted from these operations.

Twenty-five years ago, Gorham Parsons, Esq., at the solici-

* The reason of this was that this bull was sickly, and got but very few calves. He was found to be so uncertain, (a fact that was not, and could not have been known to those who selected him, and who had but *two* to select from,) that no farmer dared to risk him; not that any one lacked confidence in the breed, but that he was very rarely successful. Those that he did get, of which several are still living, are superior animals.—Ed.



JERSEY HEIFER "DAISY" 20 MOS OLD

Property of Geo. H. French, Andover.

tation of Col. Pickering, then president of the Essex County Society, presented the Society with an Alderney bull, of superior promise. He was stationed at West Newbury, on the farm of Mr. Newell, where he remained for several years, and was favorably regarded. I am informed by that gentleman that his progeny still remain in the town, and that they have some of the peculiar characteristics of the race, especially in the quality of their milk, clearly showing, what has been asserted by Col. Jaques and other growers of fancy animals, that the influence of the male in raising good stock for the dairy, is quite as important as that of the female. Farmers who presume to keep an inferior brat of a bull as the associate of their cows, make a great mistake. Keep well formed bulls only, and such as have come from cows of good character for milk, both quantity and quality—the latter is quite as important as the former, for all purposes except for sale in the market, and for that also, when the tricks of the trade are fully understood.

It was a favorite notion of Col. Pickering, to improve our dairy stock by rearing the offspring of those cows which had proved good, and by giving premiums for such, and such only. And to do this, to give encouragement to those who would bring forward the offspring of such cows when they arrived at maturity. But so little of system is there in the movements of our Agricultural Societies, governed by officers chosen annually, and by committees of a mushroom's growth—here to-day and gone to-morrow—that I am not able to say that any decided benefit has resulted from these offers, though it is easy to see that they embrace the only rational mode of bringing about valuable improvements. Suppose Coke or Bakewell had operated with as little regard to system as we do, when would their improvements have been perfected? The truth is, if we would have any thing valuable we must labor for it. There is no propriety in awarding premiums for animals that *chance to be good.* It is those which are made good by care and attention that are to be rewarded, and those only.

A short time since I visited the farm of a gentleman, adjoining the farm of my father, who has spared no effort to secure a superior dairy stock. He had Durhams, Devons and natives, with an expectation of Alderneys, all at the highest prices, av-

eraging not less than $75 an animal. On inquiry of his herdsman which was the best cow for milk in the yard, (and there were a dozen or more there,) the answer was, "that dark-colored, crumpled horn, raw-boned, ill-looking cow; she gives more and better milk than any cow in the yard." After what I have said, it is perhaps, unnecessary for me to say she was a native. I appeal to farmers whether they have not witnessed something of the same kind in their own herds. He that selects an animal for milk because her form is comely, or her face beautiful, is in great danger of being deceived in his choice. There are other indices of quality much more certain, not omitting the far-famed escutcheon index of Guenon—of which I have heard much and know little—but what I do know is decidedly in its favor. No man who would have a good dairy stock should be unmindful of this sign.

On a recent visit to the farm of Mr. Payson, of Rowley, he informed me that within ten years last past he had examined and carefully tested the qualities of more than one thousand milch cows, of every name and variety, and he frankly stated, that the best milkers he had ever met, take them individually or as a class, came from the droves gathered in Maine or New Hampshire. In selecting these animals he had regard to their external characteristics mainly, their form, their build, their general expression, such as an experienced eye embraces, although there may be no word to give it. Said Mr. Payson: "When the merits of imported animals have been blazoned abroad, and the defects of native carefully exaggerated, I have sometimes thought that the sin of the owner was laid at the door of the brute beast. No matter by what name your cattle are known, or how complicated may be their pedigree, so long as they are not well fed and cared for, they will be no better than the ill-formed native stock, which, in many places, like the lean kine of Pharoah, seem to be 'forsaken of God and abused by man.'" At the same time, as I passed through his extended barns, I saw a young Jersey bull, recently obtained of Mr. Motley, from the Massachusetts importation, at a cost proportioned to his reputation, carefully boxed up in the barn, and fed on the best that could be furnished; while natives of the same age were gnawing the parched herbage on gravelly knolls, with no one

to sympathize in their short comings. Why this distinction in the treatment of these animals? How does this compare with the gentleman's remark just quoted, from his truly sensible address before the county society? The fact is, these animals cost more; therefore, according to the rule laid down by Hudibras, they are taken to be worth more,

"The worth of a thing
Being so much money as it will bring."

Our farmers cannot afford to feed stock as these imported animals require to be fed. In 1848, Mr. Phinney, of Lexington, who had the stock of the State Society in his keeping, reported their bill of fare to be twenty pounds of English hay, two quarts of Indian meal, and a peck of carrots to each animal over one year old, daily. This report was sanctioned by the trustees of the State Society, and endorsed by Abbott Lawrence and others, whose authority as indorsers will not anywhere be questioned. Let us look at this feed and see for what it can be afforded. Twenty pounds of hay must cost at least fifteen cents, two quarts of Indian meal at least five cents, a peck of carrots at least five cents, the care of the animal at least five cents; so that the daily board and keeping will be thirty cents, or, with a little nipping on Sunday, two dollars a week. What farmer can afford to keep cows thus, when the returns of a good dairy stock, as they average, are not equal to more than half this amount? It is a good herd of milking cows where the cows, on an average, yield milk that sells for five dollars a month through the year. Farmers cannot afford to keep cows whose milk will not pay for their feed. There must have been some misapprehension on the part of Mr. Phinney, who was reputed to be fully informed in the mysteries farming like a gentleman, or else the class of animals he had in keeping will not answer for New England farms. Facts are stubborn things, as every man who attempts to gain a living by farming, sooner or later learns.

In confirmation of the foregoing views, I beg leave to quote a part of a letter, written to me on the 8th of August last, by the "model farmer" of Plymouth County, a gentleman of as much experience and observation in farming as any other in

Massachusetts, at the present time. "It is," says the Hon. Mr. Allen, "the work of time to determine the true character of imported animals. They are long affected by the change from the milder climate of Europe to that of New England. When these animals become partially acclimated, and pass from the provident care and critical attention of the importers to some purchasers with extravagant expectations, another trying change is passed, and defects not unfrequently ascribed to the animal which should be accounted for from the management. Has it not been by some process like this, that the Ayrshire cows have fallen into disrepute? The points in those animals certainly indicate an aptitude to secrete milk. The Durham cattle are pronounced by many to be too tender for this climate, but with proper attention they are profitably raised for beef; and crosses with this breed have given us some fine cows, and decent working oxen—more remarkable, however, for size than any other quality. The greatest benefit which has been realized from imported cattle, has been realized in crosses with those called native. This, if judiciously pursued, will tend to preserve a healthy and thrifty race. As at present advised, I should prefer to have the Devon blood predominate. Strength of constitution to endure the rigors of the climate, and susceptibility of taking on flesh with ordinary feed, are greater objects with the generality of farmers, than merely size. Probably there is a mixture of all the blood now found in Europe in what we call native stock. Systematic crossings will, no doubt, produce the most profitable race for the yoke, the dairy, and the market."

BULLS.

ESSEX.

From the Report of the Committee.

Twelve bulls were entered for premiums. Eleven only were upon the ground. The Alderney bull entered by Mr. Waters, was wanting. The committee were sorry that they did not have an opportunity to examine this bull in com-

pany with his brethren of different blood. Besides, a full blooded Alderney is an animal which has never been exhibited at our show, and from the reputation of the stock, and the real beauty of the animal, would have attracted much attention.

Dr. Robinson, of West Newbury, entered a bull three years old, one-quarter native, and three-fourths North Devon. This bull was a very fine one, combining more good points than any other upon the ground, and was backed up by two heifer calves of his getting, which promise not only to be handsome animals, but good milkers. This is the only certain evidence which can be furnished a committee of the good qualities of a bull, and we wish that in all cases, when a bull is offered for premium, specimens of his stock would accompany him,—so that premiums may be awarded more justly.

A good looking bull was observed by the committee, or some of them, the second day, which was not in the pens the first day of the show, nor was any entry made of him with the secretary. If he had been properly entered and exhibited, he would have probably taken the second or third premium.

The chairman of the committee desires to say a word or two generally, in relation to the awarding of premiums for bulls, in this county, which may in part as well apply to other animals.

At one time, a question of great difficulty, which occasioned much discussion and antagonism among agricultural writers, was this: "Whether the breed of live stock be susceptible of the greatest improvement, from properties conspicuous in the male, or from those conspicuous in the female parent?" Prize essays have been written, and the subject has been most thoroughly discussed, until the unanimous verdict of both practical and scientific observers now is, that, other things being equal, the male has far more influence than the female in fixing the characteristics of the progeny. The greatly superior value which the Bedouin of the desert, places upon his mare, over his horse, has been frequently and triumphantly cited in opposition to this theory. But Abd-el-Kader, in his reply to General Daumas, who has just published a work entitled "The Horse of the Desert," puts that matter at rest most naturally and conclusively. The Arab Chief in reply to the French

General, says: "You ask me why, if the offspring partakes more of the male than of the female parent, the mares, notwithstanding, sell for higher prices than the horses. The reason is this: he who owns or purchases a mare, hopes that all the while he is making use of her, he will obtain from her a numerous progeny; but he who owns or buys a horse derives from it no other benefit than its services for the saddle, as the Arabs never take money for the use of their horses, but lend them gratuitously."

This fact being established, every man sees and will admit, that in the improvement of our cattle, the bull must perform the most important part. There is no doubt of the truth of the theory, and being true, how does the practice of our farmers, in the main, conform to it? Why, with some exceptions, but generally, the calf that comes late in the season, when veal is at the lowest, and is so diminutive in size as to be of little value to the butchers, is reared for a stock-getter, *for any thing will do for a bull.* Not many of *these* animals are exhibited at our shows, for their owners would be ashamed of them; but a very large proportion of the calves dropped in this county, are sired by bulls of this description, raised here, or driven from the neighboring State of Maine.

One of the exceptions may be as bad, and it is this. Occasionally, a very large bull calf is dropped, and the owner, if he cannot afford to raise him himself, advertises his wonderful merits, and some inexperienced man purchases him, for his size alone, never asking or caring for his ancestry; but his extraordinary size, which may be his worst defect, is regarded as sufficient to overcome any and all defects. Such animals are generally pampered, crowded, and kept with a particular eye to the cattle show. The neighbors, far and near, are called in to visit him, and an animal well fed, in high condition, with a sleek coat, is always an object of attraction; for, as has been well said by an Englishman of good sense, "fat will cover faults."

These last find their way surely to the shows, and friends and neighbors of the owners are all there, prejudiced in their favor and proclaiming their comparative merits. Now there are few men in our county, (and I say it with all deference,)

who are judges of cattle, in the highest sense of the word, who are able to discern merit, or the promise of it, under a rough skin and an unpampered condition, or who have strength of mind sufficient to reject a defective form, which, from its sleek covering and high condition allures the common and unpracticed eye. The calves got by such bulls would probably be large, but so coarse in bone and in general characteristics as to be comparatively useless.

This society, regarding the importance of the bull, have always offered liberal premiums for the best animals of this class, upon condition that they be kept for use within the county for a certain length of time. Why this condition? For no other reason than that the stock of the county might be improved by them. A bull, however handsome, has no value in himself. It is only his superior *get* which makes him valuable. Now, of all the prize bulls for the last thirty years, what one of them has been the father of prize bulls? We must look at things as they are, not as we think they ought to be, and who ever recollects a bull entered for a premium claiming to be the offspring of a prize bull.

Now, if the instance cannot be found, or is so rare as to be an anomaly, are we improving our stock? I heard an intelligent gentleman, a butcher, now sixty-five years old, residing within the county, who has always had an eye for a good cow, not long since say that the cows in our county are no better now than they were forty years ago. If this is not true in its fullest extent, it comes very near it. And why is it? Because nobody among us breeds cattle with any system, with any definite object in view, with even the exercise of common judgment. And we might perhaps justly substitute state for county, excepting those gentlemen who breed purely from imported stock, which, from their beauty of form, for all of them have an aptitude to fatten—always command high prices. The great object of all English breeders of cattle has been to attain the greatest weight and maturity in the shortest time and on the least quantity of food. The Alderneys are not included in this remark, but they have been so little time among us that it is impossible to speak understandingly in relation to them.

But I cannot go into the subject of breeding. I wish more

particularly to suggest the adoption of some system by which committees and competitors shall be governed. The societies of other States, copying the example of England, have established scales of points, by which all the foreign breeds of cattle are judged, and no animal not having a certain number of points, can in any event obtain a premium. I hope that the Secretary of the Board of Agriculture, among all the other good things which he may recommend, will suggest a scale of points by which to determine the merits of our native stock, and that it will be adopted by us. Then every body, competitors as well as committees, would have something to guide them. Now one man regards the color and shape of the horns, another the setting on of the tail, another the shape of the head, one a coarse, large framed animal, another a small compact one, and there are as many different principles, real or imaginary, which govern men in making up their judgment, as there are judges. In general now, if a man attends to the condition of his animal, has him as fat as possible, he is sure of a premium. These remarks are made generally without any intention of applying them to the animals exhibited this year, for they were not so deserving of any such censure, as oftentimes has been the case in previous years. They are made simply because an evil exists which ought to be remedied, and attention is called to the subject with the hope that the remedy will be applied.

T. E. Payson, *Chairman.*

WORCESTER.

From the Report of the Committee on Bulls of One Year old and under.

The number of entries in this department was unusually small—only three—two for premium and one for exhibition.

This class of animals is receiving a larger share of the attention of farmers than formerly, and the notion has now become pretty generally entertained by them that it costs no more to keep good breeds of neat stock, than poor or indifferent. Hence the importance of having our dairy cows and working oxen of breeds of known excellence for their respective purposes. As

most of our farmers depend largely for whatever profits may be derived from farming operations upon their dairy, it should be with them a matter of the first moment to secure the best breeds. That there are found occasionally, in farmers' yards, one or two specimens of native breed, or those which are reputed such, of superior excellence, is admitted. But is there any assurance that those qualities will be transmitted to their offspring by the use of any known native breed? Are not the repeated failures in the matter an admonition that but little reliance can be placed upon the experiment?

No one will question for a moment that our native stock can be improved. Yet few farmers, it is presumed, have thought upon any thing like entering upon a systematic courseof breeding, whereby distinct characteristics will become established, and unfailing properties developed. This is to be the result of a long course of careful breeding before the public confidence will be secured in their favor, and until this systematic course is pursued, and a native breed of known and approved merit is established among us, is it not the part of wisdom to avail ourselves of the experience of those whose attention has been long directed to that subject, and which has resulted in the production of breeds of distinct and unfailing characteristics, and of known and approved excellence? Hence the Durham, Devon, Ayrshire, and other foreign breeds of stock, which have been imported into the country. English stock breeders have long understood this subject and acted upon it. An English farmer cannot afford to keep a poor or indifferent breed of stock. Nor should a Massachusetts—a Worcester County farmer.

The importance of this subject cannot be overstated; and notwithstanding the few animals seen in the pens to-day, of full and part blood of foreign breeds, yet the number of improved stock in the farmers' yards in this county would be found to be very limited.

Aug. G. Hill, *Chairman.*

From the Report of the Committee on Bulls over one year old.

The ranks to-day, when properly marshalled, and the roll duly called, stood as follows:—

Class I. No. 1. Devon bull, six years and six months old, belonging to Massachusetts Society for Promoting Agriculture, raised in Lexington and kept in this State.

No. 2. Devon bull, three years old, raised in Worcester and now belonging to Silas Bailey, of Boylston.

No. 3. Bull one-fourth Ayrshire and one-half Galloway, four years and one month old, raised in Uxbridge, and belonging to Lewis S. Taft, of Uxbridge.

No. 4. Durham bull, three years and nine months old, raised in Vermont, and belonging to Phineas A. Beaman, of Princeton.

No. 5. One bull, part Devon, two years and four months old, raised in Worcester, and belonging to Walter Bigelow of Worcester.

No. 6. One bull, half Ayrshire, two years and three months old, raised in Millbury, and belonging to John Park, of Millbury.

No. 7. One North Devon, two years and three months old, raised in Sutton, and belonging to Nathaniel Dodge, of Sutton.

Class II. No. 1. One three-fourths Devon, one year and one month old, raised in Sutton, and belonging to Harvey Dodge, of Sutton.

No. 2. One Ayrshire, one year and four months old, raised in Worcester, and belonging to William S. Lincoln, of Worcester.

No. 3. One bull, one year and three months old, raised in Grafton, and entered in the name of Nathan Handy.

The committee congratulate the society upon the unusually fine display of animals in this department of the exhibition. The number of entries, in the first class particularly, was quite as large as usual, and the animals were all of a character to do credit to the exhibition. In the second class the number of

entries was smaller, and the animals presented did not exhibit as high a degree of excellence as many of those in the first class, still the committee were unanimous in the opinion that they were deserving of the premiums offered by the society.

GEORGE S. TAFT, *for the Committee.*

HAMPDEN.

From the Report of the Committee.

Bulls and Bull Calves.—The committee on this class of animals, submit, with a few remarks, the result of their action. The importance of the subject is our apology for trespassing our opinions uncalled for. When we realize the fact that the character of our domestic animals, whether intended for the dairy, the yoke, the stall, or an earlier readiness for the market, as grass fed beef, depends almost entirely upon that of their parents, we see the necessity of rightly discriminating between a stock of well established character, and those which are used by too many as a matter of mere convenience to perpetuate their distinctive and widely different qualities. The almost entire negligence of our farmers generally, in this respect, is one great cause of just complaint. The unparalleled prices which have recently been paid by some of the most distinguished stock breeders of this country, for selected animals from the celebrated stock of Thomas Bates and others, in England, place this subject in its true light, and entitle them to the gratitude of every American, for their liberality of mind and purse. Could we animate our farmers with a portion of that enterprise and spirit of rivalry upon this subject which was recently developed by those more immediately interested in the exhibition of horses in this city, we should see results which would astonish the most sanguine. Your committee were pleased in examining the animals presented for their adjudication, to notice the improvement already commenced. Most of them were intimately related to ancestors of high character; the Durham, Ayrshire, Devon, and native stock, were all represented, and their various affinities were readily discovered in another class.

S. W. HARRISON, *Chairman.*

FRANKLIN.

From the Report of the Committee.

The committee on bulls are much pleased to be able to say that the exhibition exceeded, both in numbers and quality, that of any previous year since the society was incorporated. The whole number of entries was eighteen, all of which were animals that show that the farmers of Franklin County are becoming aware that the short road to a highly improved stock is by improving the sires.

The importance of good dams cannot be too highly appreciated; but when we remember that the dam can only bring forward one of her own progeny annually, on which to bestow her pride, and that the sire, with all the importance of a turkey-cock, can marshal his fifty or one hundred around him, we see that by selecting the bulls of the county, there can, in two or three years, be a change affected in the stock that will add thousands of dollars to its wealth.

A few years since, an association of ten farmers, of Conway, bought a bull, eighteen months old, of the short-horned breed, for which they paid $100; and it is safe to say that his progeny were worth, on an average, from five to ten dollars apiece more than those of ordinary breeds. So with the stock of the famed Childs' bull, of Deerfield, fair specimens of which (though the best) are the Arms' and Stearns' cattle, were exhibited last year and this, from Conway.

Every farmer in Shelburne knows that the character of their stock has been entirely changed, within a comparatively short period, by the enterprise of a few individuals, who entered upon an honorable emulation with each other in procuring the best possible males from which they breed their domestic stock.

Our committee believe that your society can in no way do as much to improve the cattle and cows of the county, as by increasing the amount and number of your premiums upon bulls.

They are gratified to know that a distinguished citizen of our county, (Henry W. Clapp,) has called the attention of its

farmers to the subject in a manner that cannot fail to interest, by the liberal donation of $200 to the one that can carry off the palm at the annual fair of three New England States. I trust that the farmers of Franklin will give this offer a hearty response, as it is a lottery, unlike to others, in which there are no blanks, though but one capital prize.

Those animals which received the awards, were all of them of the Durham breed, the merits of which need no encomium from us, more than a reference to the splendid teams brought in from Shelburne and Conway last year, and from Shelburne this, in each of which towns, as has been stated, much attentio has been paid to crossing with that breed.

G. Dickinson, *Chairman.*

NORFOLK.

Report of the Committee.

The committee on bulls report that the whole number on exhibition was ten. After a careful examination of their merits, and being governed by the importance of encouraging the use, only, of such animals as are known in pedigree, and of pure blood, the committee make the following awards:—

Class Devon.—For the best full blood, the first premium to Aaron Davis Weld, of West Roxbury. For the second best, the second premium to John S. Eldridge, of Canton.

Class Ayrshire.—For the best full blood, the first premium to Lemuel Billings, Quincy. No second premium awarded.

Class Alderney.—For the best full blood, the first premium to Lyman Kinsley, of Canton. No second premium awarded.

In conclusion, the chairman of the committee submits the following remarks:—

When we consider the immense loss which is annually sustained by the breeding and rearing of cattle of an ordinary character, we are impelled to urge upon the attention of our brother farmers, the absolute importance of improving their stock, by the introduction of pure blood animals, and of such

only as are best adapted to the purposes for which they are wanted.

Much mismanagement and misunderstanding have hitherto existed in regard to this most necessary department of husbandry. Hence the bad results which have accrued from the indiscriminate crossing of what are termed native stock with blood or grade animals, without regard to their distinctive qualities. For instance, to cross a common cow with the Ayrshire bull—her progeny with a Durham—this with a Hereford—and again, perhaps with a compound of all these bloods—would be a retrograde movement, rather than any definite approach towards the object to be attained.

It may then be considered as one of the most important elements of success to breed from pure blood animals. Appropriate treatment and proper food are of great consequence; but it is not so much to these that we are indebted, as to the peculiar tendencies of the race from which we desire to raise stock. The desideratum which we should seek to supply is the breed which possesses certain properties, whether for the dairy, the stall, or the yoke.

To "breed directly in the line," is now admitted to be the best, if not the only safe method for the improvement and perpetuation of the blood; and in all cases from pure blood on one side, and if possible from the male. The best animals of the class desired should be selected, and, following down in a direct line, the purity of the offspring should be maintained, only changing occasionally from one family (not breed) to another, to preserve vigor of constitution.

The chairman of the committee, having expressed the above views, would recommend to the farmers of Norfolk County to dispense, as far as practicable, with bulls of a nondescript character, and to avail themselves of such as are known to be of pure blood,—confining themselves to the class which may be best adapted to their own locality or purpose. Maturity and good constitution should be sought for in the dam, in which case, although the male be young, if healthy and vigorous, her progeny will be more affected with the general character of the breed to which he belongs than with his size or age.

MARSHALL P. WILDER, *Chairman.*

MILCH COWS AND HEIFERS.

ESSEX.

Report of the Committee.

The committee on milch cows regret that there was not a better show of animals of this class; and indeed they may say that, for several years past, there has been quite a falling off, both in numbers and quality, of the cows exhibited at our shows. It is believed by the committee that there is a large number of very superior milkers in the county, but, for reasons unknown to your committee, they are not generally brought forward at our exhibitions. It would certainly be desirable to know something about these cows, as to their breed and yield in milk and butter, that the community might avail themselves of such statements and procure calves from the cows for raising. The chairman of this committee has a large and valuable cow, which he was unwilling to risk over the railroad to Lawrence, and he appends to this report a statement of her yield, in the hope that his example may hereafter be imitated by others.

Moses Newell, of West Newbury, presented for exhibition only, three cows, one eleven years old, of the Durham breed, one Durham and Ayrshire, and one Ayrshire, also two calves. These cows had the marks of being extremely good milkers, but were not in so good condition, as to flesh, as the draft made upon them required they should be. In the opinion of the committee, the better the milker, the closer she should be looked after as to the quantity of her feed; and they do not subscribe to the general belief, that a good milker must necessarily be thin in flesh.

JOHN ALLEY, 3d, *for the Committee.*

Statement of Samuel Southwick.

I offer for examination a cow of the Galloway or no-horn breed, eight years old. She calved in March, 1852, and has continued to give milk ever since. I have kept an account daily as I sold it to my neighbors. She has averaged nine quarts a day for the whole period, amounting to four thousand

nine hundred and thirty-two quarts; the quality of the milk is esteemed first rate for family use. We have not used it for butter, selling to better advantage for four cents a quart in summer, and five cents in winter. I have given about six quarts of shorts daily, besides common pasture feed in summer, and good hay in winter.

LAWRENCE, September 28, 1853.

Statement of James Poor.

I offer for premium, my cow "Fountain," a native, nine years old. She had her first calf at three years old, has had one every year since, and has never dried for these six past years. She calved June 26th, 1852; again May 20th, 1853. She had seven days' sickness that month, in which I kept no account of her milk. I began to weigh her milk the 1st of last October; weighed up to the night of the 27th September, 1853. She has given 8,304 pounds of milk in that period. She has made 310 pounds 14 ounces of butter, up to the 26th of this month, from which, 338 quarts have been taken, which have not been set.

		lbs.	oz.
1852, October,	butter,	32	13
November,	"	26	8
December,	"	21	12
1853, January,	"	22	12
February,	"	19	14
March,	"	21	2
April,	"	13	4
May,	"	20	4
June,	"	41	3
July,	"	29	5
August,	"	33	14
September,	"	26	9

Her keeping, last winter, was clover and run hay, with three quarts shorts per day. In summer, common pasturing, except in July, when it was very dry, I fed her on hay night and morning.

A sample of her butter may be seen in the hall.

NORTH ANDOVER, September 28, 1853.

Statement of Moses Newell.

The subscriber enters for exhibition only, one starred cow, eleven years old, a descendant of the bull Admiral, presented by Admiral Coffin, to the State Society. She has not been dry for four years, has had a calf each year in the summer, is now nearly dry, and will calve in about six weeks.

The cow with the most white is six years old—dropped her last calf in February last—is from a white Durham cow and an Ayrshire bull, imported by Mr. Cushing, of Watertown. She resembles the bull in form, color, and general appearance.

The two cows above described, have frequently given more than twenty pounds of milk at a milking.

The one-horned cow, is Ayrshire, five years old, is now dry, will calve probably in three or four weeks, is from the Cushing importation; gives rich milk, and about fifteen pounds at a milking, in good grass feed. I have presented them merely to show the varieties of stock. My experience shows that there are good milkers among all the varieties.

I also present, for exhibition only, two calves, one with white spot, from a Durham cow, now lame, or she would be here; came the 27th of June last—has had the milk of his mother only. The other from the red cow, part Durham, dropped the 3d of July last—fed like the other. They are from a bull dropped by the starred cow. I design to raise them for a pair of oxen.

West Newbury, September 27, 1853.

Statement of John Alley, 3d.

I have owned my cow "Fanny," two years last April. She is a cross of the Ayrshire and Durham, and is seven years old. She calved the 18th of June last. The first week, in addition to what the calf took, she made of butter, 4lbs. 6oz.

The calf was then sold. The week ending

July	2,	sold	58	quarts of milk, and made			8	"	2 "
"	8,	"	70	"	"	"	4	"	14 "
"	15,	"	81	"	"	"	5	"	12 "
"	22,	"	88	"	"	"	3	"	6 "

July	29,	sold	74	quarts	of	milk,	and	made	3 lbs. 8 oz.
Aug.	5,	"	77	"	"	"		4 "	
"	12,	"	67	"	"	"		4 "	8 "
"	19,	"	88	"	"	"		2 "	2 "
"	26,	"	86	"	"	"		2 "	6 "
Sept.	2,	"	88	"	"	"		2 "	6 "
"	9,	"	90	"	"	"		1 "	9 "
"	16,	"	92	"	"	"		1 "	8 "
"	23,	"	90	"	"	"		1 "	10 "
"	29,	"	77	"	"	"		1 "	2 "
			1,128	quarts.					51 lbs. 3 oz.

Lynn, October 29, 1853.

MIDDLESEX.

From the Report of the Committee.

We found in the "pens," this year, an unusually large and a most excellent collection of milch cows; we were rejoiced at this sight, for we believe that of all the various animals, whether quadruped or biped, that go to make up a complete stock for the farm, the milk-giving portion are the most useful, beautiful and indispensable.

In addition to the great number of cows offered for premium, there were some very noble animals sent for exhibition, by Gorham Brooks, Esq., of Medford, and by S. G. Wheeler, Esq., of Concord, which added much to the interest of the fair, and for which favor, these gentlemen deserve the thanks of the society.

In conclusion, the committee would express their sense of the wisdom of that arrangement, peculiar to the present, which gives a separate day for the committees to make their examinations. We hope it will be continued.

L. Eaton, *Chairman.*

South Reading, October 25, 1853.

Statement of A. S. Lewis.

"May Queen," a full blood Ayrshire cow, aged seven years, raised at Marshfield, on the farm of the Hon. Daniel Webster, calved twenty-fifth April last, average yield of milk, per week, in September, one hundred and ninety-six pounds, giving one pound of butter for sixteen pounds of milk, or twelve and a quarter pounds of butter, per week.

"Eugenia," a full blood Durham cow, dropped in April, 1848, raised in Worcester County, calved in April last. Average yield of milk, one hundred and seventy-three and a half pounds per week in September, giving one pound of butter for seventeen pounds of milk, or ten and a half pounds of butter per week. In 1852, her yield for nine days in June, was fifteen pounds twelve ounces of butter; for nine days in September, twelve pounds butter.

"Victoria," a half Ayrshire, and half Jersey cow, age four years, raised on the farm of the Hon. Daniel Webster, at Marshfield; average yield of milk per week in September, one hundred and seventy-two pounds, giving one pound of butter for fourteen pounds milk, or twelve pounds five ounces butter per week.

"Rosa," a three-quarters native and one-quarter Ayrshire heifer, age three years, raised on the farm of the Hon. Daniel Webster, at Marshfield, calved in June last. Average yield of milk per day in September, was twenty-two pounds.

"Fanny," Ayrshire heifer, age two years two months and fifteen days, calved in August last; wishing to raise her calf, have allowed it to drink all the milk. Raised in Roxbury, Mass.

My stock of milch cows consists also of one full-blood imported Jersey about calving; one native cow, which gives as great a yield of milk as the others,—she is about calving.

"Daniel Webster," a full-blood imported Jersey bull, age four years,—offered for premium.

Feed. Common pasture, cornstalks at night, with two quarts of shorts, or mixed bran for all the stock.

Framingham, October, 1853.

Statement of John Raynold.

"Lady" was four years old on the 10th of June, 1853, and is of Ayrshire and Durham blood. She has had three calves; her last being dropped about the first of June, since which time, till about the first of September, (three months,) she has on an average filled a pail measuring nine and a half quarts, (beer measure,) twice full, daily, of very rich milk, making about nineteen quarts, including froth. The person who has milked her is not a fast milker, and therefore, the amount of froth has been less than it otherwise would have been. I should judge that her average strained milk for the three months named, has been not less than fifteen quarts per day. Her feed has been a common pasture, with one quart of meal per day, and occasionally a feed of green corn. She is perfectly gentle, and always minds her own business, a trait of character which I regard as of great value in a milch cow.

I refused $100 for her about two months since.

We have never made butter from her, but have sold about eight quarts of her milk daily; have used cream mostly in our family, and the hogs have had their full share.

Concord, October 5, 1853.

Statement of Converse Smith.

The Ayrshire cow which I offer for premium, is seven years old; she came in about the first of April, and gave about sixteen quarts of milk per day until the feed got short, when she did not give quite so much. She gave twelve quarts per day the first of October, after she had been milked six months; no grain or roots of any kind.

The native cow is ten years old; she came in in November, and has been milked over ten months. The greatest quantity that I milked from her was nineteen quarts in one day, or forty-seven and a half pounds; she gave the first of October about nine quarts per day. Her milk is very rich. I think she is the best cow I ever owned.

Waltham, October 5, 1853.

Statement of George M. Barrett.

The six cows exhibited by me, as a dairy, are from three to ten years old; they have been kept in my pastures, which have been short, up to the present time, except two that have been in better feed for two or three weeks past. Some of them had one quart of rice meal a day, in the dry weather, and have had corn fodder at night, the latter part of the season; they gave, at their best, one hundred and three and a half quarts per day, lawful measure, an average of seventeen and a quarter quarts per day; and they gave, last week, seventy-seven and a half quarts per day, an average of about thirteen quarts per day, each.

The Ayrshire cow, "Jenny Deans," exhibited by me for premium, is fourteen years old; she was imported by the Massachusetts Agricultural Society, and kept by them at Mr. Phinney's, several years, and about four years since they made a present of her to the Middlesex County Agricultural Society, and I purchased her of the society about the first of January last. She came in the 10th of May last, and has been kept with ten or twelve other cows in my pastures, with rather short feed; through the dry weather I gave her one quart of rice meal per day, and the latter part of the season, corn fodder at night; she gave, the fore part of the season, eighteen and a half quarts of milk per day, and gives now, ten quarts, lawful measure. She is said to have given, when young, and kept by Mr. Phinney, twenty-seven and a half quarts per day.

Concord, October 4, 1853.

Statement of Elijah M. Read.

The Alderney cow, "Europa," offered for premium by me, is eight years old; was imported from the Island of Jersey, in 1851. She calved in October, about two months after she came into my possession. The average quantity of milk given by her, the next nine months, was nine quarts per day; the greatest flow of milk was twelve quarts per day. Her milk has not been kept separate from that of my other cows, excepting for the purpose of testing its properties for butter. The first trial

was in August, 1851, about two weeks after she arrived in this Yankee land, and about two months before she calved. I found by this trial that four quarts of her milk would yield a pound of butter. The second trial was in February, 1852; we used for the family, three pints of her milk per day, and the balance in seven days yielded eight pounds of butter. One more trial was had in the last of October of same year, and the result was thirteen and a half pounds of butter in nine days. She had at this time given milk over one year, her last calf then being more than one year old. She dropped her next calf on the 17th day of May, 1853. The whole quantity of milk given by her since, I am unable to state.

The next trial of her milk for butter was made in May, about two weeks after she calved; in seven days she gave one hundred and ten quarts of milk, from which was produced seventeen and three-quarters pounds of butter. The last trial was had within the last two weeks. She gave in nine days eighty-five quarts of milk, yielding sixteen and a quarter pounds of butter, equal to twelve and a half pounds of butter per week.

Her keeping through the winter, was two quarts of corn and cobmeal, one quart of shorts, and good hay; in summer, good pasturing, with the addition of some grain during the drouth in July and August, and while we were testing the properties of her milk for butter, she had two quarts per day. Her greatest flow of milk was seventeen and a quarter quarts per day, which was in June last.

Tewksbury, October 4, 1853.

Statement of John B. Moore.

Six days last June, this cow gave the following quantity of milk:—

First day, twenty-nine and a half quarts; second day, twenty-eight and a half quarts; third day, twenty-seven and a half quarts; fourth day, twenty-seven and a half quarts; fifth day, twenty-seven and a half quarts; sixth day, twenty-seven and a half quarts, wine measure. Feed—grass, and two quarts rice meal per day.

Concord, October 5, 1853.

Statement of Jonas Viles.

No. 1, has given twenty-one quarts per day, for a number of days in succession; she has been milked eleven months since she had a calf, and gives at the present time, nine quarts per day, and comes in again the first of January. Breed, half Ayrshire and native; she has had the second premium.

No. 2, has given eighteen quarts per day, has been milked ten and a half months, comes in again in January; gives at the present time, eight quarts per day; breed the same as No. 1.

No. 3, four years old, has given sixteen quarts per day, for two weeks; has been milked six months since calving, and gives at the present time, eleven quarts per day—calves again in April; breed, native.

No. 4, four years old, has given fourteen quarts per day, for a number of weeks in succession; breed, Ayrshire.

These other cows have given fifteen quarts per day; give a good mess during the season.

Lexington, October, 1853.

Statement of A. G. Heywood.

This certifies that this cow, which is four and a half years old, gave twelve quarts per day, last winter, after her calf was killed; she is three-fourths Devonshire breed.

Concord, October 4, 1853.

Statement of Asa G. Sheldon.

One milch cow, seven years old. This cow may well be called the long-lived native breed, her mother being twenty-five years old when she brought this calf. She was raised in the town of Union, in the State of Maine, and calved the 27th day of last February. Her milk was mixed with other cows' milk the first of the season, and she gave a good mess. We then discovered her milk was of an excellent quality for butter. The last week in August, her milk was set by itself and it produced eleven and one-quarter pounds of butter. The month of September, her milk produced forty-three and a half pounds.

The last nine days in September, she produced twelve pounds of butter, which is here on exhibition. Five quarts of the above-named cow's milk, produces a pound of butter.

WILMINGTON, October, 1853.

From the Report of the Committee on Heifers.

The committee on heifers found a large number of fine animals entered for premium. The competitors were so fairly matched it was difficult to decide which was best, and they wish, on that account, that a larger number of premiums could be awarded.

There can be no doubt that an increased interest is awakened among the farmers in this matter. The statements which were handed in by the owners of the milch heifers confirmed this. The animals themselves confirmed it. And the younger stock, numerous and well formed, is an indisputable evidence of this growing interest.

The milch heifers entered were nearly all natives. Many of the younger animals, the one year and two years old, were of the Ayrshire, Durham and Devon stock. The best heifer calf, and a choice one to, in the judgment of the committee, was of the Alderney breed.

LEONARD HUNTRESS, *Chairman.*

LOWELL, October, 1853.

Statement of Jonas Viles.

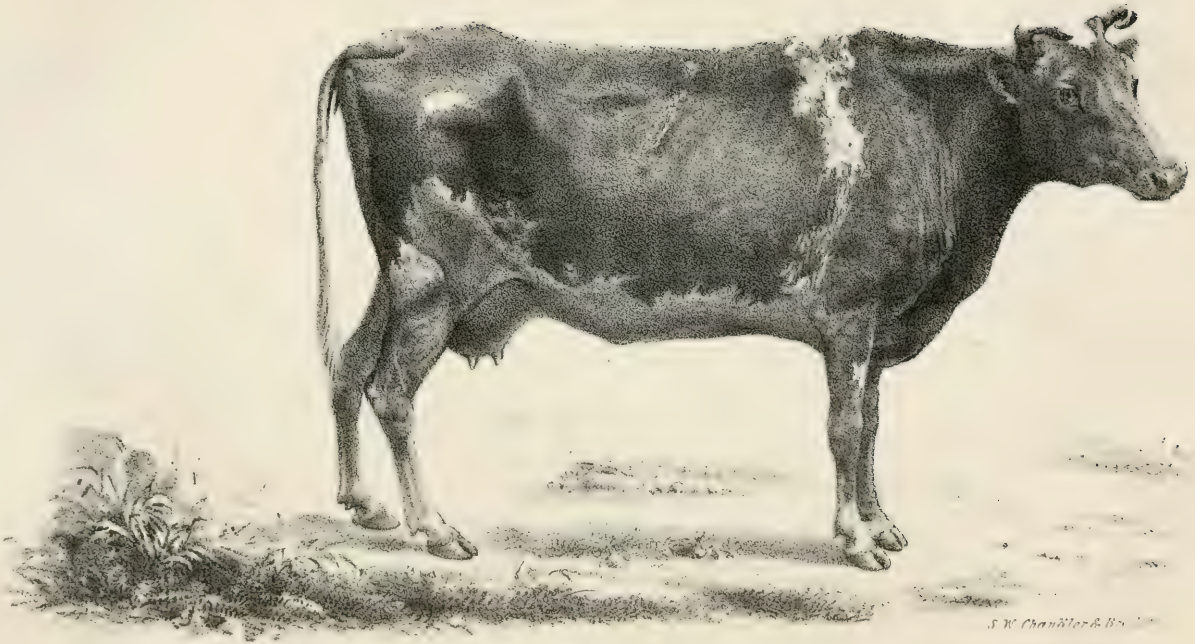
My heifer has given nine quarts per day for three months in succession; has been milked six months; calves again April next and gives six quarts per day at the present time. Breed, Ayrshire and native.

WALTHAM, October, 1853.

Statement of George M. Barrett.

The heifer calf exhibited by me is three-fourths Ayrshire, one-fourth native, five and a half months old; it was raised by putting it to a cow that gave milk through the last winter, and comes in again this fall; it sucked about three months, since then it has remained in the pasture with food only.

CONCORD, October 4, 1853.



JERSEY COW COUNTESS.

Property of Mass. Society for Pro. of Agriculture.

Statement of Rufus Meriam.

The heifer which I have offered for premium is of the native stock. She is fourteen months and five days old. She took from a cow about two quarts of milk a day for the first six months, and during the same time, I gave her a gill of meal morning and evening; since then she has been kept on hay and grass, with half a pint of meal per day.

Lexington, October 3, 1853.

Statement of George M. Barrett.

The milch heifer exhibited by me is two years and ten months old, half Ayrshire and half native. She came in last April; has been kept with ten or twelve other cows in my pastures, with rather short feed; the latter part of the season has had corn fodder at night. She gave, the fore part of the season, twelve and a half quarts of milk per day, and gives now seven and a half quarts, lawful measure.

Concord, October 4, 1853.

Statement of Samuel Chandler.

The Devon heifer which I offer for premium was raised by me, and is twenty-three and a half months old. She is a mixture of the celebrated Patterson stock of Devons, with that imported by the Massachusetts Agricultural Society.

Her keeping has been of the ordinary kind both in summer and winter. No grain or meal of any kind.

Lexington, October 3, 1853.

Statement of William Spencer.

The Devon heifer I offer for premium is near ten months old, and was raised as follows:—The first week after she was calved was fed on new milk twice a day, about three quarts at each time, after which she was fed on skim milk night and morning, adding one quart of new milk to each mess and a little hot water, enough to bring the whole to the heat of new milk; this was continued until she was eight weeks old; she

was then fed on hay and a few carrots until about the first of May; she has since run in a pasture having nothing but grass.

The heifer, four months old, is half Alderney and half native, from a cow formerly owned by the late Hon. Daniel Webster, and now owned by J. W. Paige, Esq., of Boston. She was calved on the fifth day of June, and run eight weeks with a farrow cow, since which time she has run in a pasture and had nothing but grass.

LOWELL, 1853.

To the Trustees of the Massachusetts Society for Promoting Agriculture.

Gentlemen:—In a communication which I have just received from the Hon. E. R. Hoar, late president of the Middlesex Agricultural Society, he informs me that he had a conversation some weeks ago with one of the members of your Board, in regard to the mode in which the State Society could best promote agricultural improvement through the agency of the county societies; and that he then suggested, that if the trustees of the State Society had funds which they could spare for the purpose, it might be well for them to divide the State into districts, perhaps four in number; the western counties one, Worcester and Norfolk one, the southern counties one, and Essex and Middlesex the fourth; that should the sum appropriated admit of it, $150 should be offered in each district as premiums for the best dairy of cows, not less than six in number, which should have been owned for five months previous to the cattle show by the exhibitor, divided into three premiums of $75, $50, and $25, open to competition to any person in either of the counties composing the district, and offering it in Middlesex this year, and in Essex next, or *vice versa*, and in like manner in each of the other districts.

In case the funds of the society would admit of offering only $100 to each district, in premiums of $50, $30, and $20, or in two premiums of $60 and $40, it might be proportionably useful.

The foregoing plan presents a mode of offering premiums, which, if not entirely new, has been adopted only to quite a limited extent by any of our agricultural societies. The object

is one of great importance; the advancement of that important branch of agriculture which pertains to the dairy. Hitherto the attention of agriculturists has been mainly directed to improved modes of culture, with too little regard to the dairy, or the stock best suited to its purposes. It is true, that to this end the trustees of the Massachusetts Society have, for many years past, directed their attention, and not without beneficial results. That all their efforts should have been crowned with entire success could not reasonably have been expected. That they had aided in awakening the minds of farmers to a sense of the importance of greater improvement in this branch of husbandry, cannot be questioned. There is still much need of further effort to advance this department, and bring it nearer to perfection.

In the confident belief that the plan above mentioned, if carried out under proper regulations, would have a useful and beneficial effect, I beg leave to offer it for your consideration, cherishing the hope that it will not be deemed unworthy of your adoption and encouragement.

Very respectfully, your obedient servant,

SAML. CHANDLER.

LEXINGTON, January 9, 1854.

BOSTON, February 18, 1854.

Gen. Samuel Chandler, Lexington:—

Dear Sir:—Your communication of January 9th, was duly received by the trustees of the Massachusetts Society for Promoting Agriculture, and has been considered by them with all the attention which was due alike to its subject and its source.

At the last meeting of the Board, the undersigned were appointed a committee to communicate to you the conclusion to which the trustees had come, with full powers to arrange all the details which might be necessary for carrying their views into effect.

You have done the trustees of the State Society no more than justice in saying that "they have directed their attention for many years past to the advancement of that important part of agriculture which pertains to the dairy." They deem no

department of husbandry more interesting or more important, and they will gladly avail themselves of the suggestions of experienced farmers, in doing whatever more may be in their power in the same direction.

With this view, and in conformity with the general ideas of yourself and Judge Hoar, they have authorized and instructed the undersigned to select four counties in different quarters of the Commonwealth, in which premiums for the best dairy of cows shall be offered by the State Society during the present year, and they have appropriated the sum of six hundred dollars for the purpose. Should the result of this experiment fulfil the expectations which they are encouraged to form, it is not improbable that a similar course will be pursued in the other counties in succeeding years.

For the present, however, we are authorized to announce to you, and through you to the farmers of Middlesex, and other parts of the State, that the agricultural societies of Middlesex, Berkshire, Worcester, and Bristol, are hereby severally empowered by the trustees of the State Society, to offer the following premiums for the present year, and to call upon our treasurer for their payment, viz. :—

For the best dairy of cows, not less than six in number, and which shall have been owned by the exhibitor and kept within the county not less than five months previous to the cattle show, $75. For the second best do., $50; for the third best do., $25.

You will observe that we have so far departed from your suggestions, as to confine the competition to the separate counties, instead of adopting the district system, which you proposed.

And we desire, also, to add, that the whole responsibility of judging as to the cattle exhibited, and of awarding the premiums, is intended to be left to the county societies, respectively, subject only to the conditions and limitations which have been already stated.

We remain, dear sir, respectfully, your obedient servants,

ROBT. C. WINTHROP,
JAMES BROWN,
GEORGE W. LYMAN,
} *Committee.*

WORCESTER.

Report of the Committee.

The complaint annually repeated by committees on this class of stock, may justly be reiterated, on this occasion. While the premiums for excellence, offered by the society, are most liberal, amounting to nearly one-half the value of a good animal, and are so multiplied, in gradation, as to offer a reward in the competition, for all but an inferior one, the number of entries has always been very limited, and a compliance with the rules, most usually, quite imperfect. When it is considered how unsatisfactory must be the judgment of the properties and value of a milking cow, from mere inspection of her appearance in a public show, the reasonableness of the requirement of the trustees, for an account of her product, during a part, at least, of the season, must be apparent, and should readily be acquiesced in by those who desire that the test of an examination here, should be such as to evince just discrimination between the different races, and secure a preference for such as possess the most desirable qualities.

There is no description of stock in which there are so great variances as the cow. It is quite true, that there are certain prominent points, which may generally be seen in a good animal, but the eye has often been sadly deceived in the selection, and an animal of promising outward appearance, has proved, not unfrequently, but a poor acquisition to a too confident purchaser. On the other hand, an animal, the least prepossessing in form, may possess the most valuable properties. For instance, Mr. Parkinson, a distinguished herdsman of England, in his account of the Alderney cow, says: "Their size is small, and they are as bad a form as can possibly be described; the bellies of many of them are four-fifths of their weight; their neck is very thin and hollow; the shoulder stands up, and is the highest part; they are hollow and narrow behind the shoulders; the chine is nearly without flesh, the hocks are narrow and sharp at the ends, the rump is short, and they are narrow and light in the brisket." Yet, Youatt, another writer, who in the main concurs with Parkinson in this description,

admits that although the Alderney "yields very little milk, that milk is of an extraordinary excellent quality, and gives more butter than can be obtained from the milk of any other cow." And Martin, another author of credit, declares that "in proportion to the quantity of milk, the butter it yields is astonishing. A single cow has been known to give nineteen pounds of butter, weekly, for several successive weeks." Now, whether Mr. Parkinson's representation of the external appearance of the Alderney cow is exaggerated or not, (as doubtless it is,) who would not prefer to take her with all these defects of shape, in the assurance of "nineteen pounds of butter weekly, for several successive weeks," to most perfect symmetry of form, with no more than ordinary milking qualities? Yet, in the pens of a New England cattle show, it would require something more than the passing observation of a committee, however good judges of external points and appearance, for such a competitor to bear away a premium. With neat stock, as with a higher race of created beings, the homely and trite adage, that "handsome is, that handsome does," is especially applicable. It is not merely the fairest exhibition in the pens which can claim the preference, but united with this, there should be the product and profit of the animal for all the purposes for which it is raised and kept. Hence the importance of a compliance with the details of the rule enjoined by the trustees on the committee, in the examination of this department of the exhibition; and in an adherence to that rule should be seen a vindication of the judgment and discrimination with which the premiums are awarded.

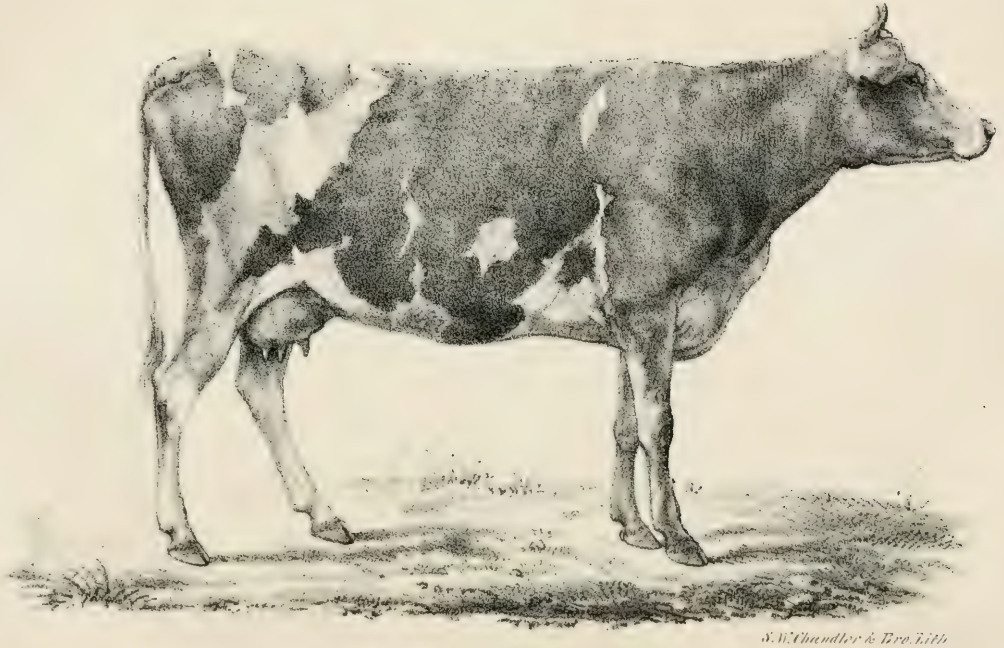
That there exists in the County of Worcester the elements for as fine a dairy stock as can be found elsewhere, cannot be questioned. More than fifty years since, our race of native cattle was greatly improved by the introduction of a cross with the finest stock of England, imported by the Hon. Christopher Gore, of Boston—a gentleman as justly distinguished for his liberal contributions to the cause of agriculture, as for his eminent accomplishments as a statesman and jurist;—and this cross, known afterwards as the "Gore Breed," was productive of many animals of rare excellence, raised among us. Subsequently, the importation by our own late honored and lamented

fellow-citizen and associate, a vice-president of this society, Stephen Williams, Esq., of Northboro', gave us the blood of the Durham race in "Denton"—undoubtedly the noblest specimen of the improved short-horns which New England has ever seen. Simultaneously, or soon after, we had, as means of further improvement, the use of "Cœlebs" and "Holderness," by the importations of Mr. Coolidge and Mr. Parsons, respectively;—the "Cream Pot" stock, carefully and judiciously bred by Col. Jaques; and more recently, through the munificence of Mr. Cushing, of Watertown, the Ayrshire blood in a fine bull presented by him to this Society; and still later, and now, both Ayrshire and the beautiful Devons, by the bounty of the Trustees of the Massachusetts Society for the Promotion of Agriculture. With such instrumentalities, and with skill and care in breeding, our exhibitions should be rich in animals most valuable in their adaptation to all the purposes of husbandry. With the Devons upon our native stock, for the yoke; the improved Durhams, in the blood of "Denton," for the stall, and the Ayrshires for the dairy, there can be no obstacle to the production of the finest stock of any desirable variety; and perhaps even, through judicious crossing, the characteristic qualities of all the races may, to a considerable extent, be found united.

That the Ayrshire cow, upon the whole, is the best contributor to the milking-pail, seems now to be generally conceded by English breeders; and it may not be too much to assume, that the result of their introduction into this country abundantly justifies that preference. The improved short-horns, as contradistinguished from the Ayrshire, for a long time contested the palm; and of this race, indeed, the most remarkable instances of milking and butter producing qualities are well authenticated. In a late number of the Journal of the Royal Agricultural Society of England it is stated, that Mr. Ferguson, an English breeder, in an account given by him of a high bred cow, which he purchased in 1819, has thus written:—"As to milk and butter, the quantity of each was so extraordinary, that I should say it was quite incredible, had I not myself been an eye-witness of it. It was tested in two ways, wherein there could be no doubt. For many weeks she gave thirteen quarts at one

meal, each quart producing two ounces of butter; the quantity being so large, I had the milk kept by itself, and at seven days' end, we churned twenty-six pounds of butter." And, he adds: "this cow, during the time, got nothing but grass from an ordinary pasture." Of another short-horn cow, he reports "an extraordinary yield of milk and butter from an animal of capital feeding qualities, and of good points and breeding. This cow gave, on a pasture of middling quality, twenty-eight quarts of milk per day from the time of calving in spring till mid-summer, and averaged twenty quarts of milk per day for twenty weeks. In thirty-two weeks she produced three hundred and seventy-three pounds of butter, averaging eleven and two-thirds pounds per week; the greatest weekly quantity given, during that time, was seventeen pounds, and the least seven pounds."

The chairman of this committee was himself once the owner of a cow, often exhibited and admired in our pens, of the half-blood of "Denton," of large size and great beauty, which gave from twenty-five to thirty quarts of strained milk per day, for several successive weeks, and of such amazing richness, that the late Col. Pickering, finding occasion, in the course of his famous controversy with Col. Powell, of Philadelphia, as to the relative value of the native and imported breeds of neat cattle, to inquire into the matter, on being shown a pitcher of the cream, fresh from the skimming, flatly declared, that it had been already churned! Such, however, are rare instances, and may be regarded as furnishing little assurance of general production. It is not the intention of the committee, nor is this the fitting opportunity, to discuss the merits of particular breeds. We wish only to suggest, that what has been done elsewhere, may be done again, and here,—and that with judgment in the selection of stock, and care in the rearing, as fine animals, of any race, may be found on our farms, and seen at our shows, as ever graced the cattle fairs of England. The properties and products of every race have frequently been given to the public by numerous breeders of great intelligence, both in this country and in Europe; and he among us who, by a careful examination and presentment of the evidence, in a brief compendium of instances and facts, should now furnish the ready means of comparison and preference to the practical farmer, would



JERSEY HEIFER MINNA.

Property of Mass. Society for Pro. of Agriculture.

render a service to the interest of husbandry which could not be overestimated.

In the exhibition of this day, the committee have not found the number of animals, nor the degree of excellence, which might have been expected. The entry, indeed, is respectable, but from the largest agricultural district of the Commonwealth, it should have been far greater. By the secretary's books it appeared, that but five cows were offered for premium, and nine were presented for exhibition only. The committee carefully and repeatedly examined all, and so far as their inspection and the testimonials submitted to them would allow, they have endeavored to assign to each their rank, in value, as milking animals.

Among the animals offered for exhibition, the committee noticed, with particular satisfaction, two cows, each four years old, of the true Alderney race, imported by the Hon. Stephen Salisbury, always a most active and liberal member of this society, and one of the board of trustees. These cows had been purchased by him on his recent visit to Europe, and were selected without regard to cost, on a full assurance of their purity of blood. They arrived here only on Saturday last, in a bruised and disfigured state, from a long and boisterous passage of more than sixty days. They certainly are in the worst possible condition to produce a favorable impression, by their appearance. Yet, as "touch of their quality," it was shown to the chairman of the committee, that one of these now certainly not very prepossessing looking creatures, fresh from a voyage across the Atlantic, with scarce strength enough to rise upon her legs, and not having even recovered her appetite for food, yielded two quarts of milk at a milking, which, by the test of the Lactometer, standing twenty hours at a guage of nine inches, gave two and a half inches of cream; while of the milk of eight of the best dairy cows of the owner, at the same guage, and for the same length of time, with which it was compared, the highest shows but one inch and one-eighth, and the lowest but one-half an inch! On another anniversary, we may hope to see how far care and good condition will enable us to appreciate these valuable cattle. The thanks of the society are eminently due to their public spirited proprietor for the introduction of

this race into the county, and for permitting their presence under so many disadvantages, to give interest to our show.

LEVI LINCOLN, *Chairman.*

Statement of Samuel Ellsworth.

1. What number of cows constitute your dairy? *A.* Ten.

2. What their age respectively? *A.* Two, nine years old; one, seven years old; three, four years old; three, six years old; and one, two years old.

3. What their breed? *A.* Five half Durham, one half Ayrshire, one half Holderness, and three of native breed.

Where bred and raised, and by whom? *A.* Six bred and raised by myself, one bred by Elias Ayres, in Barre, one by E. W. Paige, of Hardwick, and two I do not know where.

5. On what day did they drop their last calf, and what was the quality of the calf? *A.* My dairy commenced dropping their calves in February; nine of them dropped them by the 15th of April, and one the 11th of June. I raised nine calves, and the remainder were sold for veal.

6. They were turned to pasture the 12th of May.

7. The cows which I offer for premium had in June two quarts of provender per day, and four quarts of potatoes; when on trial in September, each cow had two quarts of shorts and one of provender, per day.

8. The five cows, three of which I raised, made in the first ten days of June, two hundred and thirty-six and a half pounds of cheese, and in the first ten days of September, one hundred and ninety-five and a half pounds. The 11th of June they made nine pounds of butter, and the 11th of September six pounds.

9. Besides the butter and cheese used in my family, I sold $295.46 worth. The ten cows made 3,268 pounds of butter and cheese.

10. I have kept four old hogs and eight pigs; they have had no grain until the first of August, since then fed six barrels of barley and six of corn. The hogs and pigs are valued at $151.

11. The nine calves which I raised are valued at $135.

Cow No. 1. "Georgiana," six years old; calved March 9th;

will calve again the 11th of February; went dry seven weeks, raised calf, and yielded, in the first ten days of June, 456 pounds of milk; first ten days of September, 366¼ pounds of milk.

No. 2. "Red Rover," nine years old; calved in March; will calve again the 25th of February; went dry eight weeks, raised the calf, and yielded, in the first ten days of June, 444½ pounds of milk; first ten days of September, 369¾ pounds of milk.

No. 3. "Ayrshire," six years old; calved in April; will calve again March 5th; went dry ten weeks, raised the calf, and yielded, in the first ten days of June, 453½ pounds of milk; first ten days of September, 335¼ pounds of milk.

No. 4. "Young Spot," six years old; calved in March; will calve again March 7th; went dry seven weeks, raised the calf, and yielded, in the first ten days of June, 407½ pounds of milk; first ten days of September, 318 pounds of milk.

No. 5. "Young Daisy," four years old; calved in April; will calve again the first day of March; went dry eight weeks, raised the calf, and yielded, in the first ten days of June, 370 pounds of milk; first ten days of September, 280½ pounds of milk.

Statement of H. P. Reed.

My dairy consists of five cows; those exhibited were seven and ten years old; the three others, three, six and nine years; the red cow, (exhibited,) Devon and Holderness breed; the starred cow, (exhibited,) Ayrshire, Holderness and native; the others Ayrshire and Holderness; the red cow calved May 22d, the starred cow calved May 9th, calves both heifers, good ones and being raised. The other cows calved 21st and 28th of March, and April 1st, calves all being raised. Red cow dried March 21st, and the starred cow March 1st, and they will calve in April; turned to pasture May 1st, and fed once a day since August 20th on corn fodder; 175 quarts of milk sold besides the milk and cream used in the family of six persons; 385 pounds of butter made from the time of turning to pasture till September 13th; keep four swine. The calves were fed upon new milk eight weeks, and upon skimmed milk three weeks longer.

Red cow made, during first ten days in June, 21½ pounds butter; and during the first ten days in September, 15 pounds and 15 ounces, and yielded, during the first ten days of June, 453¾ pounds of milk; first ten days of September, 275½ pounds milk.

Starred cow made, during the first ten days of June, 17 pounds of butter, and during the first ten days of September, 12¾ pounds, and yielded, during the first ten days of June, 380½ pounds of milk; first ten days of September, 233 pounds of milk.

PRINCETON.

Statement of J. W. & Wm. W. Watson.

Our dairy consists of five cows—two of them are four years old, one six and one two years old; one of them is of the Durham breed, two, half Ayrshire, one, half native, and one, half Devon; we raised three of them, John Brooks raised one, and B. Harrington one; two of them calved in February, the other three in March, calves all raised and of good quality; four of the cows will calve in March and one in May; they were dried in the fore part of winter; turned to pasture the last week in May. Two and a quarter pounds butter each day in June, and one and three-fourths pounds during each day in September. During the first ten days in June, 100 pounds of four meal cheese were made, and in the first ten days in September, 80 pounds. From the time of turning the cows to pasture till the 20th of September, we made 537 pounds butter and 1,133 pounds cheese; twelve to fourteen in family; keep two old hogs and nine pigs, fed with little meal and few potatoes.

Cow No. 1. Yielded, from the 1st to the 10th of June, 33¾ pounds per day; from the 1st to the 10th of September, 26¾ pounds.

No. 2. Yielded, from the 1st to the 10th of June, 37¾ pounds per day; from the 1st to the 10th of September, 26 pounds per day.

No. 3. Yielded, from the 1st to the 10th of June, 36¾ pounds per day; from the 1st to the 10th of September, 27¼ pounds per day.

One of the above is a two-year-old heifer.

From the Report of the Committee on Heifers over two years old.

The committee appointed to award premiums on heifers of two years and upwards, have the pleasure to submit the following report:—

The number of competitors was eighteen, who have offered for examination thirty animals; fourteen three years old, and sixteen two years old. Four two years old heifers were offered by John Brooks, of Princeton, and two by Stephen Salisbury, of Worcester, for exhibition only. The committee take great pleasure in saying that many of them were very superior animals, making the duty extremely difficult to decide who were entitled to the premiums.

Amory Holman, *Chairman.*

From the Report of the Committee on Heifers less than two years old.

Your committee, having attended to the duty assigned to them, respectfully ask leave to report:—

Being fully aware of the respect paid to this kind of animals by all classes of society, they have not lightly regarded the responsibility which their trust imposes upon them. Hence they have endeavored to enter upon their duty with unbiassed minds, regardless of circumstances in which competitors may have been placed, provided they had complied with the requisitions of the society, and have designed to be impartial in all their decisions.

Immediately after the creation of man, God gave him a right to use the animals that were below him in the scale of organization, to enhance his comfort, his pleasure, and his gratification; and also for his sustenance, and the purpose of labor. Man thus became lord of the animal creation. He accordingly uses one animal to warm him, another for purposes of pleasure, and another to feed and nourish the body. But among the different species and varieties of animals, not the least honored and respected, or the least useful and beneficial, is the heifer, which

is so soon to take the place of its mother that stands at the head of all our domestic animals in point of usefulness. When we contemplate her beautiful traits of character—her docility, symmetry of form, placid countenance, forbearance under ill treatment, which sometimes she receives by those who would be called men, and even gentlemen—and the benefit she is destined in future to confer on mankind, we cannot but admire her, and exclaim, that she is in many respects worthy of admiration and imitation.

Your committee, on examination, found thirty-two yearling heifers entered as competitors for premiums, and one for exhibition; as also twenty-one calves to compete for the premiums, and five for exhibition; and after due deliberation, decided to award the first premium to Harrison Bacon, of Barre, for the best yearling heifer, seven-eighths Durham; to Charles Bowen, of Worcester, the second premium for the second best heifer, three-fourths Durham; and to Marshall J. Maynard, of Northboro', the third premium for his heifer, one-half Durham. They have also awarded to Harrison Bacon, of Barre, the first premium for the best heifer calf, seven-eighths Durham; the second to Nathaniel Dodge, of Sutton, for a calf half Devon.

Your committee found but one lot of five heifer calves, which, by the rules of the society, were entitled to a premium; those were presented by Samuel Ellsworth, of Barre, and to him we award the first premium. Four of them were three-fourths Durham, and one, half Durham.

They are happy in saying that they found many specimens that were an honor to the occasion and to their owners, and had it been in the power of your committee to have granted them all a gratuity, it would have cheerfully been done; but they were deprived of the satisfaction, for want of means and power so to do.

They would gladly go into detail and specify the excellent qualities which all seemed to possess, in a greater or less degree, would circumstances permit; but the prolixity of the subject forbids such a course.

We cannot forbear, however, alluding to some few that seem to stand out prominently. And in the first place, we were peculiarly struck with five heifer calves, from two to six months,

one-half Ayrshire, presented by John Brooks, of Princeton. They were fine specimens, entered for exhibition.

Harvey Dodge, of Sutton, presented a beautiful calf, one-half Devon; the mother, only three years old, being present with her second calf, she having been recently sold for $80, (as your committee were informed by the owner)—a sufficient comment upon the calf.

There were also two calves presented by William S. Lincoln, of Worcester, which attracted the attention of your committee, and they would recommend them to the public as fine specimens of stock; as one also presented by Henry Boyles, of Princeton, one-half Ayrshire, one-half Devon.

Harrison Bacon, of Barre, presented five splendid heifer calves, and had they come within the rules of the society, which required them to be taken from the cow at eight weeks, would unquestionably have taken the first premium.

There were three very fine yearling heifers offered by Rejoice Newton, of Worcester, three-fourths Durham; and also one of the same breed by Benjamin Willard, of Lancaster, which we would speak of in terms of approbation.

J. Warren Bigelow, *Chairman.*

WORCESTER WEST.

From the Report of the Committee.

The cow is second in interest and importance to no other one of our domestic animals; she affords to us all many of the luxuries and comforts of life, and to the farmer much of the profits of the farm. For milking purposes she differs in value; some failing to pay their keeping, while others give large returns for the cost of food consumed. How to rid ourselves of the worthless, and supply their place with superior animals, is a question of great interest to us all, and should be the constant study and care of the dairyman. We should not, for small and mistaken present gains, select, as many of us do, our best calves from our superior cows for the butcher, reserving inferior ones to supply our future dairies, perpetuating, by the process, a race of cattle, certain, in three or four generations, to be-

come nearly or quite worthless. We should rear the best calves from our best stock, regarding the fact that a calf worth eight dollars at six weeks old, on becoming a cow, at three years old, will be worth thirty dollars; while a calf at the same age worth six dollars, will not, on becoming a cow, at three years old, sell for more than twenty-five dollars. Thus, by raising our best stock, we secure five dollars at three years old, for an outlay of two dollars at three weeks old; besides continuing a race of animals that will be constantly improving.

It is a well-established maxim in the breeding of cattle or growing of plants, that like produces like. Cows for the dairy should be selected from a long line of good milking stock, and be fed, from early youth, with abundance of food of such quality as will promote health, and the enlargement of the lactescent vessels, and the consequent secretion of milk, and keep the animals at all times in good condition. High blood will avail but little in the veins of an ill-fed, half-starved cow. In keeping cattle, warmth and comfort is of more importance than many farmers, from their practice, would seem to admit. The temperature of the atmosphere affects the quantity of food the animal requires; the greater the difference of temperature between the body and the atmosphere in which the animal lives, the more food they require to keep up the natural warmth of the body, and less of the food will be converted into milk or muscle. Hence the importance of warm stables in winter, and sheltered pastures in summer, and sheds for milch cows to rest under in rainy and cold, dewy nights. In selecting cows for the dairy, regard should be had to the quantity and quality of food designed for them. If the food is good and abundant, large cattle may be selected; if poor and less abundant, small cattle will prove most productive. In general, in either case, small cattle give the largest return in proportion to the cost. The larger the bone and muscle the greater will be the daily want, and greater will be the quantity of food required to maintain it. Small cows will therefore yield a greater return of bone, muscle, or milk, in proportion to the food consumed, than large ones. Cattle require, for daily consumption, about two per cent. of their live weight of good hay, or its equivalent, to keep them in

present condition, or to supply the daily want of their bodies. All over this may be converted into bone, muscle or milk. If, therefore, we have a given quantity of food, say thirty pounds of good hay, or its equivalent, to convert into milk, and feed it to a cow weighing ten hundred pounds, she will, after using two per cent. of her weight, or twenty pounds of the hay, to support her daily natural want, have ten pounds to convert into milk, bone or muscle. But if we feed the thirty pounds of hay to a cow weighing fifteen hundred pounds, she requiring two per cent. of her weight, or thirty pounds of hay to supply her daily want, or to keep her in present condition, she will have none remaining to convert into either milk, bone, or muscle, and instead of yielding a profit, will be nearly worthless for the dairy, and valuable only as a machine to convert her food into manure. Hence the fact so generally observed, that small cows give the richest milk. They waste less of their food in sustaining their own bodies. Good dairy cows convert less of their food into flesh and more into milk, which gives that lean and long appearance so generally observed in our best milking stock. The external marks characteristic of a good dairy cow have been so often and so well described, the committee will not name any of their own. They, however, beg leave to recommend to their brother farmers the study of M. Guenon's work on milch cows, believing that if they will make themselves familiar with the marks therein described they will never be disappointed in the purchase or rearing of a cow for the dairy.

The cows exhibited and coming under the inspection of the committee, were five in number, all of which were creditable to the show, as well as to their owners. For the best lot of dairy cows of not less than nine in number, owned and kept together from June first to September tenth, one of which shall be exhibited, the committee award the society's premium to William Robinson, Jr., of Barre. Mr. Robinson's whole dairy consists of twenty cows, of half Durham breed, all kept together and alike. The twenty gave, on the second day of June, 702 pounds of milk, averaging 35.1 pounds each. This milk made seventy-eight pounds of cheese, or one pound of cheese to nine pounds of milk.

The nine cows offered by Mr. Robinson for premium, gave,

the first ten days in June, 3,549 pounds of milk, which made 394¼ pounds of cheese. The first ten days in September, they gave 2,527 pounds of milk, which made 280 pounds of cheese, or 33.755 pounds each, daily, which made 674¼ pounds of cheese—one pound of cheese to a fraction more than nine pounds of milk.

For the best lot of cows of not less than six in number, one of which shall be exhibited, the committee award the society's premium to William Robinson, Jr., of Barre. The six cows gave, the first ten days in June, 1,991 pounds of milk, which made 215¼ pounds of cheese. The first ten days in September they yielded, in milk, 1,508 pounds, which made 170 pounds of cheese. In both periods their yield of milk was 3,499 pounds, or 29.16 pounds each, daily; which made 385¼ pounds of cheese—one pound of cheese to a fraction more than nine pounds of milk.

Mr. Robinson deserves great credit for the management of his dairy, and his example is worthy of imitation by others. His cows gave large returns, yielding, on the second day of June, 35.1 pounds of milk each, and each making 3.9 pounds of cheese, which, at nine cents per pound, is thirty-five cents per day. Add to this thirty-two pounds of whey—about the quantity the milk would yield after extracting the curd—worth four cents for feeding hogs, and we have thirty-nine cents, the daily return of each cow.

For the best cow, kept alone or with others, the committee award the society's premium to Daniel H. Rice, of Barre, for his native red cow, eleven years old. The live weight of this cow, the committee estimated to be eleven hundred pounds. She gave, the first ten days in June, 371 pounds or 37.1 pounds of milk daily, from which was made nineteen pounds of butter. The first ten days of September she gave 311 pounds, or 31.1 pounds of milk, daily, which made sixteen pounds of butter. During both periods, she yielded 682 pounds of milk, which made thirty-five pounds of butter. Her average daily flow of milk was 34.1 pounds. Her daily make of butter was 1.75 pounds. She gave, daily, 3.1 per cent. of her live weight in milk, and 5.13 per cent. of her milk was butter. This cow is remarkable for holding out, she falling off in her milk, from

the first ten days in June, to the first ten days in September, only sixty pounds in ten days, or six pounds a day.

For the next best cow, kept alone or with others, the committee award to James W. Jenkins, of Barre, the society's premium, for his large red cow, three-fourths Durham, nine years old, and weighing 1,444 pounds. This cow produced, the first ten days in June, 422½ pounds of milk, which made 15.85 pounds of butter. The first ten days in September, she gave 385 pounds of milk, and made 9.33 pounds of butter. During both periods she yielded 807½ pounds of milk, and 25.18 pounds butter was made from this milk. Her average daily flow of milk was 40.37 pounds, which was equal to 2.79 per cent. of her live weight, daily, and her milk was 3.12 per cent. butter. Such cows as this would probably prove more profitable to the butcher or grazier, than the dairyman.

The other cow, entered for premium by Mr. Perry Johnson, of Barre, was a large red cow, thirteen years old, of native breed. She suckled her calf since June 14th, and she does credit to the well-earned reputation of Mr. Johnson for good stock, but as Mr. Johnson failed to comply with the rules of the society, the committee could not award him a premium.

There was also a cow entered by Warner Smith, of Barre. She was a noble, large cow, with twin calves by her side, and would do credit to any farmer. Mr. Smith being one of the committee, deemed it fit to withdraw his cow from competition.

In conclusion, the committee congratulate their brother farmers of Worcester West, on the success of their show to-day. The pens have been well filled with cattle and swine, and the coops with fowls, which must be gratifying to all who are, like the committee, lovers of good beef, pork, and poultry.

JOHN BROOKS, *Chairman.*

Statement of William Robinson, Jr.

My dairy amounts to twenty cows, all kept alike and together. They are one-half Durham, were dried in February, and calved in March and April. Nearly all calved again in March and April. Nineteen of the calves were sold to raise, for $186, and were taken when from three to ten days old. The second

day of June they gave seven hundred and two pounds of milk, from which was made seventy-eight pounds of cheese. During the first ten days of September, was made three hundred and seventy-seven pounds of cheese. The nine cows entered for premium were,—one, 7—four, 6—three, 5—and one 4 years old, yielding, during the first ten days of June, 3,549 pounds of milk, which made 394¼ pounds of cheese. The first ten days of September, they yielded 2,527 pounds of milk, which made 280 pounds of cheese. The six cows entered for premium, five of which are 5 years old, and one, 4 years old, yielded, during the first ten days of June, 1,991 pounds of milk, which made 215¼ pounds of cheese. The first ten days in September, they yielded 1,508 pounds of milk, which made 170 pounds of cheese.

BARRE, September 24, 1853.

WORCESTER NORTH.

Report of the Committee.

The committee on milch cows were all at their posts at the appointed hour this morning, and having attended to the duties assigned them, respectfully submit the following report:—

The number of cows entered for premium was but four. Joseph P. Reed, of Princeton, is the owner of one of these cows, which is ten years old, of the Devon and Holderness breed. She gave, the first week in June, three hundred and sixteen and three-quarter pounds of milk, from which was made fifteen pounds of butter. The first week in September she gave one hundred and ninety-one and a half pounds of milk, which yielded eleven and three-sixteenths pounds of butter. Another cow is owned by Nathan B. Reed, of Princeton, which is seven years old, of the Ayrshire, Holderness and native breed. She gave, the first week in June, two hundred and sixty-six pounds of milk, from which was made twelve pounds of butter; and the first week in September she gave one hundred and sixty-three pounds of milk, from which was made eight and fourteen-sixteenths pounds of butter. These two cows have had no other keeping than by pasture during the season, up to

the 20th of August, and since that time, corn fodder once a day.

Another cow was entered by Enoch Caldwell, of Fitchburg, who has owned her about four years, and supposes her to be eight or nine years old. She gave, the first week in June, 237 pounds of milk, from which was made ten and a half pounds of butter; and the first week in September, she gave 220 pounds of milk. She has had no extra keeping, having been fed through the winter on hay and corn fodder only, and through the summer has fed in a quite dry pasture; but since the first of August, has had green stalks twice each day.

The remaining one of these animals is owned by John P. Sabin, of Fitchburg. She is of the Durham breed, eight years old, calved 7th of March, the calf weighing at one day old, 108 pounds. She gave the first week in June, 266½ pounds of milk, and the first week in September, 202 pounds of milk, being 468½ pounds for the two weeks—being nearly thirteen and a half quarts per day. Amount of butter for the week in June, ten and a half pounds, and for the week in September, eight and three-quarters pounds.

The pasture in June was decently good; in September rather short. One quart of meal or two quarts of shorts, night and morning, has been her usual feed through the year.

These are all fine animals and good milkers. The committee having fully considered all the particulars respecting them,—the time at which they severally calved, the quantity and quality of their milk, and especially the expense of keeping of each,—have unanimously awarded the premiums at their disposal, as follows:—

To Joseph P. Reed, of Princeton, the first premium; to Nathan B. Reed, of Princeton, the second premium; and the third premium, for want of a fourth, they award to Enoch Caldwell and John P. Sabin, jointly, to be divided between them.

E. Torrey, *Chairman.*

Report of the Committee on two and three year old Heifers.

Perhaps no department in the labors of the agriculturist is more important, profitable, or worthy his attention, than that of the dairy. In order that he may realize fully its benefit, he must call to his aid not only science, but the observation and experience of himself and others, that thereby the means may be well and successfully adapted to the end. The farmer is, emphatically, his own recruiting officer; and as the members of his dairy company are constantly passing out of the ranks, some at a good old age, after having served their generation well, and yielded their commander many pounds of the needful, others have been turned out, being found destitute of those qualifications requisite in a good company of milkers. For all recruits, to sustain and enlarge his dairy, the farmer must turn his attention to the particular branch of the exhibition, held to-day, which has occupied the attention of your humble committee.

At the risk of trespassing upon the limits of the committee upon new milch cows, (though we will not not go into details,) permit us to say that the same traits of character and physical development are necessary in the younger members of the dairy, which are prominent in the real model milkers of maturer years. If these are wanting, it is unwise to retain such for the family. They should be at once discharged, and given their rations, until they are considered, by good judges, fit subjects for the butcher's knife; or turned over to the breeding department. For who would think of retaining at a branch of business a person that had no adaptedness or taste for that particular pursuit, especially if profit was the ruling motive in view?

Your committee regret to say, (though they were thereby relieved from otherwise so arduous a task,) that there was but one entry for premium of three-year-old heifers, and though there was no competition, yet your committee were at a loss whether to award the first or second premium, until they examined the written statement, giving the yield of this heifer during the first week of June and of September, viz. :—

She calved March 28; calf an extra one; has been kept with

four other cows; no keeping but by pasture, till the 20th of August, and then fed on corn fodder once a day, upon which she gave, during the first week in June, 202 pounds of milk, and made eight and ten-sixteenths pounds of butter; the first week in September she gave 156 pounds of milk, from which was made seven pounds fourteen ounces of butter.

Upon this statement, rather than the superior external marks for a milker, your committee have awarded the first premium to Mr. Joseph T. Reed, of Princeton, for the best three-year-old heifer, having had a calf. Breed, one-eighth Ayrshire, one-fourth Holderness, and native.

There was, also, but one entry of two-year-old heifers, having had a calf. Had the committee been furnished with her yield of milk or butter, they might have arrived at a different result; but under the circumstances, they have awarded to Mr. Joseph Upton, Jr., the third premium for his two-year-old heifer, having had a calf.

GEORGE KENDALL, *Chairman.*

HAMPDEN.

From the Report of the Committee.

The number of cows on exhibition was unusually large. Twenty-eight were entered, several of which were presented for exhibition only. Of those entered for premiums, but a portion had complied with the published requirements of the society, and but few of those who returned the circular furnished them, had fully accomplished the design of the society, by their response. These were examined in connection with the animals to which they related, as minutely as the limited time would allow, and we offer them as a part of our report.

Alden Hitchcock, of Springfield, states that his cow is seven years old, of Ayrshire and native breed; that she calved September 20th, 1852. The calf was fattened for veal, and sold for $10.22. Three hundred and twenty-one pounds of butter were made from her milk, valued at $68.74; and eight hundred and thirty-four quarts of milk sold for $20.46. Making a total income of $99.42, exclusive of the milk used in his

family. The average of milk during ten days in June, from the 10th to the 20th, was thirty-seven pounds, daily. During the required trial in September, she was dry. Has a calf at this present time. Her feed, common pasture, in summer. In the winter months, hay, with a partial feed of roots.

Zebard Foster, of Springfield, states that his cow is seven years old. Calved May 29th, 1853. Her average of milk from June 10th to the 20th, was sixty pounds, daily. The corresponding days in September, thirty-five pounds. Her feed, pasture, with four quarts of rye provender, daily.

J. H. Demond reports his cow to be of native stock; seven years old, and calved the middle of August last; she was dry in June; and her daily yield during the ten days' trial in September was forty pounds per day. Milk all marketed at four cents per quart.

Amos M. Carlton, of Chicopee, states that his cow is five years old, Durham and Ayrshire; calved August 17, 1853. The daily product of milk, from June 10th to the 20th, was an average of fourteen and one-half pounds. In September, during the same length of time, was thirty-four and one-half pounds. Mr. Carlton says, that for one year, ending March 1, 1853, her product was three thousand seven hundred quarts of milk—being an average of ten quarts per day.

In the second class, cows from two to five years, there were several which, although unaccompanied with the statements required by the society, we venture (in front of our duty) to depart so far from the prescribed regulations, as to recommend in this case that the premiums provided for this class of animals should be distributed among those possessing prominent points of excellence. We would notice one entered by O. H. Cooley, of Springfield. She was three years old; and your committee unanimously consider her a most perfect miniature cow. There were two herds of nine cows each, which were a great addition to the interest of the exhibition.

Mr. Marshal Pease, of Chicopee, is the fortunate owner of one of them, and although he offered no statement of their products as a claim for our consideration, your committee have no hesitation in pronouncing them a superior herd of cows.

Mr. Samuel Murphy, of Springfield, presented the other for

our examination; these were all in fine condition, and exhibited, severally, most prominent points of excellence. It is proper that we should here remark that none of the statements furnished have given any account of the butter produced by their cows, except Mr. Hitchcock. It is a well known fact that a great difference exists in the quality of milk from different cows in the produce of butter. Your committee are satisfied that the amount of butter should be required, as well as of milk, by all competing for the premiums.

PHINEAS STEDMAN, *Chairman.*

Report of the Committee on Heifers and Heifer Calves.

The committee on this class of animals report that they were called by their duty to examine one of the most interesting features of the exhibition, thirty-five young, handsome, and thrifty animals, whose promising appearance for future usefulness, as mothers, and milkers, is very seldom exceeded; indeed, the sight of so many, and all so good, is rare to be enjoyed. Most of them were related to those families most distinguished for their milking qualities. The Durham, Ayrshire, Devons, Herefords and native, were all represented, beside those which were only half and half of either class. The positive demonstration of an increasing interest in this department could not be overlooked, and it is a subject which still demands constant and devoted attention from every one rearing animals for the dairy or for stock breeders; in no other way can we arrive to that point of excellence so desirable in our dairy stock, particularly. The increasing demand for the best cows, and the still increasing value placed upon such, is a sufficient warrantee for still greater exertions in this matter. The committee cannot forbear the expression of their appreciation of the merits of several others. It is but justice to them to particularize those offered by A. M. Carlton, Lyman Brown, and Abel Pease; these formed a trio of superior young animals, and we hope to see them again, an ornament to our future exhibitions.

J. H. DEMOND, *Chairman.*

FRANKLIN.

Report of the Committee on Cows.

The number of cows entered for exhibition and premiums was larger than usual, (about thirty,) but not as large as is desirable. Every good cow in the county should be exhibited, to give encouragement to the farmers' holiday, as well as to show the promise for good cows and oxen in the future. The ot, as a whole, was very fine—not a poor or inferior one among them. Ten were exhibited by Mr. Timothy Stoughton, of Gill, all fine, and attracted much attention, not only from the committee, but from others; he was well worthy the premium awarded. Messrs. William Long, S. C. Taylor, and Samuel Fisk, all of Shelburne, have each a lot of three excellent looking cows, and were so from the statements given in, though not entirely complete and full. Those of William Long had each her calf by her side, giving a good promise for the future. Dr. D. D. Fisk, of Greenfield, gave a full statement of his cow, from which it appears that in the first week in June she gave over sixteen quarts of milk per day, which weighed forty-one pounds per day, and from which sixteen pounds five ounces of butter were made. This is truly a very remarkable yield of milk and butter, especially with no other feed than a common pasture. She is a native, with a cross of Durham, and your committee believe that to be the best stock of the county. The cows of Mr. Josiah Fogg, David R. Wait, and Asahel Wright, all of Deerfield, were very superior animals, and had they given a full statement we cannot say where they would have stood in the list of premiums. That of Mr. Fogg is probably one of the very best cows in the county. If premiums are expected, the rules of the society must be complied with.

H. G. Newcomb, *Chairman.*

Report of the Committee on Heifers.

The committee on heifers would respectfully report that at no previous exhibition of this society has there been a more full or better exhibition of this class of animals than the present;

there were none of inferior quality, and nearly all of them of superior merit, of comparatively large size, and of great variet of form and color. There were twenty entries for premium, and three for exhibition only; and while your committee were going through with the examination we could not but regret that we were restricted to so small a number of premiums as has been offered by the society, for we believe that no part of our exhibition should be more encouraged than raising stock, and especially, stock for the dairy. Many of the animals were so nearly of equal merit that we found it extremely difficult to decide to whom the premiums should be awarded.

A very fine heifer was entered by William Long, Jr., of Shelburne, two years old last April, three-fourths Durham, weighed eleven hundred and forty pounds. Four two-year-old heifers were presented by Thomas J. Field, of Northfield, one pure blood Ayrshire, and three half bloods; they were of medium size, good form, but gave signs of excelling chiefly in the dairy, for which the Ayrshire are so justly celebrated. There were also several heifers presented by Charles Pomroy, of Northfield, Col. Hawks, of Deerfield, Judge Grennell, of Greenfield, Samuel Fisk, of Shelburne, and others, whose names we did not ascertain.

J. S. PURPLE, *Chairman.*

NORFOLK.

From the Report of the Committee.

The number of milch cows entered for premium was fifteen. The unfavorable state of the weather prevented sending from a distance much valuable stock, which would otherwise have increased very much the interest felt in this, one of the most important departments of our exhibition.

The following are the copies of statements in relation to the yield of milk and butter, to which premiums are awarded:—

Statement of S. J. Capen.

The cow offered for premium is one-half Ayrshire and one-half Durham; eight years old. She calved May 2d, 1853; the calf was killed when three days old. From June 1st to June

10th, she averaged 23 quarts of milk per day, weighing 53 pounds. From September 1st to the 10th, she averaged 17 quarts per day, weighing 41 pounds. She was fed on grass and corn fodder.

DORCHESTER, September 27, 1853.

Statement of Francis Guild.

Native cow, seven years old. From the 10th to the 20th of June she gave 327¼ pounds of milk, which made 19 pounds of butter. From the 10th to the 20th of September she gave 250 pounds of milk, which made 16 pounds of butter. She calved March 23d; her feed grass—not good feed—and fed some with green corn in August and September; one quart of meal and one quart of shorts each day.

DEDHAM, September 27, 1853.

Statement of J. J. Dixwell.

I send my Jersey cow for exhibition. As I keep her for family use I have very little record of her yield. Her excellence is in the quality, not the quantity, for she is not a large milker. During the last week in May, and the first week in June, her milk was set aside for butter with this result:—First week, 76¾ quarts of milk, from which was made 12 pounds of butter; second week, 72½ quarts of milk, from which was made 13½ pounds. In addition to pasturage, she was fed with two quarts of shorts, one of Indian meal, and one of oil meal, each day. She calved the 5th of March. Now she gives but five or six quarts per day. On several trials her milk has produced a pound of butter from a fraction under five and one-half quarts of milk.

WEST ROXBURY, September 27, 1853.

Statement of J. W. Clark.

Native cow, six years old. Calved May 7, 1853. For the first three weeks she averaged eighteen quarts of milk per day. The first week in June we used sixty-nine quarts of milk, three quarts of cream, and made from the remainder eight pounds of

butter; the second week, used fifty-six quarts of milk, six quarts of cream and made six and a half pounds of butter. We measured the milk but once this month, (September,) she gave fifteen quarts per day. Feed three to five quarts of shorts per day, and what grass she wanted.

The committee, before closing their report, will venture some suggestions upon the general management of milch cows.

The principal and most important points are these: The selection of stock; their general care and treatment; a judicious and well regulated method of feeding.

In relation to the first of these, but little need be said by the committee, the selection being a matter depending mainly upon the taste and judgment of those interested; and of which there is almost as great a difference as there are owners. But when it is considered that the cost of keeping a good cow is but very little, if any, more than that of a poor or ordinary one, it will be conceded that this is a matter of great importance to the farmer. But with ever so good a selection, the result, so far as profit is concerned, will be any thing but desirable, unless a faithful and methodical plan, in regard to care and keeping, is most strictly adhered to. For it is believed that a stock of cows, however good, may, by only a common or ordinary mode of feeding and treatment, be reduced in their product so as to make but poor returns for what is expended upon them; while, on the other hand, a common or ordinary stock only, with judicious care and feeding, may be made to increase largely in their yield and pay a remunerating profit to the farmer.

It is difficult to attach too much importance to the second point proposed, viz.: that of care and treatment. It is believed to be no uncommon thing among our farmers, in the busy season of the year, in particular, to postpone the "milking time," till almost night, so that the men having this duty in charge, may be enabled to do their day's work in the field, and then, as a matter of course, milk the cows. Now all hands must take part in this, so as to despatch, as readily as possible, this closing job of the day. And who doubts that this, done after a hard day's work in the heat of the summer, with exhausted body, coupled with the certainty of a late supper; with the

hurried manner of driving the cows from pasture, the impatience of the men, and consequent harsh treatment of the cattle, the udder but two-thirds emptied of its contents, and in fact, the whole work, in some way or other, imperfectly done; who doubts that it is a mistake in management that must prove decidedly prejudicial in its results? A stock of cows, on the other hand, should be tended by the same help, daily—and, when it can be done by one man, never allow more to take part in it—and tended in such a way that a feeling of perfect confidence and affection will be cultivated by them for their keeper, which tender and gentle treatment will be sure to beget.

As to the manner of feeding, and particularly in the winter, it is believed that much harm results either from over or under feeding, and feeding at irregular and improper times. A stock of cows should be fed but three times in the twenty-four hours, and at just the same hour each feed. And, instead of crowding before them as much as they can comfortably dispose of, or more, feed a little sparingly, so that the crib will be entirely emptied within the hour; and if by chance a little is left, be sure and have it removed, and the crib swept entirely clean.

Care should always be taken to furnish an ample supply of pure water, say, at least, three times each day, the last watering to be as late as eight o'clock in the evening, at which time they will partake more freely than at any other. It is also advised, that provision be made for watering in the barn, instead of at any time in the winter, being obliged to have them exposed to the storms and cold without. It is believed, that by furnishing a supply of water thus to a stock of cows in milk, the quantity, by this alone, will be increased from fifteen to twenty per cent. above what it would be by the usual mode of treatment.

One other important point to notice, is the necessity of keeping cattle in a warm, but well-ventilated barn. Your committee are satisfied, by their own observation and experience, that from December to April there is great gain, both in yield of milk and flesh, by keeping a stock of milch cows tied up in the barn at least five days in seven, and that one hour of out-door exercise, in each of the two days, is all that should be allowed them. So that it may be safely stated, allowing all other

things to be equal, that a careful observance of these two latter points alone, viz.: a good supply of water in the barn, and warm and nearly equal temperature, will add, at least, one-quarter to the product. Dry bedding, day and night, with careful carding, should not be omitted.

It is believed that the average yield of milk throughout the State will not exceed four quarts per day, for each cow, through the year. Now, if this opinion is correct, it is, to say the least, discreditable and inexcusable; for it is unquestionably true, that the very same stock may be made to yield six quarts, and that, too, without any additional consumption or cost of feed, but simply by judicious and careful treatment.

Your committee, in conclusion, would recommend that a premium of $25 be offered for the greatest yield of milk per day, through the year, from ten cows, of not less than eight quarts; of $15, from six cows; and $10, from not less than four cows. Statements to be made by the applicants, of breed, mode and cost of keeping.

JNO. H. ROBINSON, *Chairman.*

WORKING OXEN.

HAMPDEN.

From the Report of the Committee.

Your committee were highly gratified with the appearance of the cattle presented for their examination. The arrangement of the cattle under their several grades by age, adds largely to the facility of their examination, and furnishes the most favorable opportunity to judge them comparatively, and the trial by draft exhibits their power, their motion, and their discipline, as well as the judgment and discretion of their driver. Much, very much, depends upon the manner in which working cattle are managed by the driver. It is not our duty to make report upon this point, but the subject is worthy of consideration, and your committee were pleased with the readiness of

those exhibited, to obey the word of the driver without the blow from his lash; and this we consider the true discipline; "a merciful man is merciful to his beast," is a maxim that should be indelibly stamped upon every yoke.

For the committee,

AARON ASHLEY.

FRANKLIN.

From the Report of the Committee.

The committee appointed to view and report upon the comparative merits of the working oxen submitted to their examination, regret that the number of entries was not larger. But twelve pairs were presented to them, and although these were worthy of high commendation, yet a larger number seems almost indispensable in order to sustain that general interest and generous rivalry in this department, which it is the aim of this society to foster. The farmer prides himself upon his fat cattle but your committee are unable to perceive why the working ox, his daily companion in toil, should not be, at least, an equal sharer in his care and solicitude.

Your committee incline to the opinion that if a deeper interest were felt in this department, a show of working oxen might be presented in Franklin County, which, like our shows of fat cattle and noble horses, would be second to no other in the Commonwealth.

Of the oxen examined by the committee, they have to speak in the highest terms of praise. They were all excellent, and it is to be regretted that the number of fixed premiums is not large enough to bestow upon more of the exhibitors, committees being exceedingly liable to error where the distinction in excellence is small.

DAVID WELLS, *Chairman.*

NORFOLK.

From the Report of the Committee.

The trial was performed by drawing a cart, loaded with two tons of stone, from the bottom of a long hill to the top, and back. Each team trying their skill and strength in backing the same load up hill, two or more times, while descending at difficult points. The same cart and load were used by each team. Your committee would add, that the work was quite satisfactorily performed by each of the competitors, Mr Tucker's oxen doing it with the most ease to both themselves and their driver. In the opinion of your committee, with some of the drivers there was quite too free use made of the whip and voice; the lash leaving marks, too true a proof of the strength of the arm that wielded it. Your committee would speak with pleasure of three yokes of oxen exhibited by A. D. Weld, as being worthy of note; their docility and training, as exhibited, were well worth the attention of farmers. They were entered for premium; but, as none were offered except on each yoke separately, your committee had not the power to award any to them, though for beauty of shape, training, and matching in color, it is doubted whether they could be excelled in the county.

We regret that a cold easterly storm prevented the appearance of so large a number of competitors as usual; and also, that, probably for the same reason, there were no town teams present. With the remark, that probably no animal on the farm repays more fully kind care and treatment from its owner and driver than the ox, we respectfully submit this our report to the society.

Royal W. Turner, *Chairman.*

BRISTOL.

From the Report of the Committee.

The committee on working cattle submit the following report:—

Nineteen pairs of oxen and seven pair of steers were entered

for competition, being two pairs of oxen and three pairs of steers more than last year. Of these, five pairs of oxen and two pairs of steers were withdrawn during the trial. The load for the oxen weighed 7,436 pounds, and that for the steers 5,050 pounds, including the weight of the wagons; being considerably heavier than those of last year; they were, however, by no means too heavy; and the ease with which every pair of cattle drew and backed the loads was evidence that all of them were good.

None of the oxen were so large and firm as some of those exhibited last year. Still there were many fine teams that won the admiration of all that saw them.

The steers were, this year, the best part of the exhibition. They were relatively better than the oxen; and in awarding premiums for them, we do it with the satisfaction that none have been better deserved. Indeed, if there were more inducements offered for steers, we are by no means certain that our working stock might not thereby be benefited more than it is by the premiums offered for older cattle.

We regret to find that while some of the best breeds of Europe are represented in the dairies of our country, very little attention has been paid to raising oxen from them.

Nearly all the cattle offered were brought from up country. Only a few were raised in the county. Still, the fine points of the best stock are as desirable in the ox as in the cow. The deep chest, the short neck, the small head, the straight back, the well made legs and fine hair, are evidence of strength and endurance; and belong to breeds of which the females prove good milkers.

Our native breeds, when well used, produce excellent oxen; there is a hardiness about them, and a submission to labor that is admirable. But a pair of oxen of good blood, of perfect shape, well kept, but not too fat, is a beautiful sight; and at the same time, when well trained and properly driven, is capable of the greatest amount of labor, and shows the greatest strength.

Oxen are the most constant, though silent companions of the farmer, and his most faithful and patient servants. They are his first care in the morning; with them he starts-a-field at

early dawn; they smoke before as he turns the furrow for his seed; they draw the manure that makes his crops; they draw his wagons that gather his hay and ripened grain; and they go with him to the woods to seek his winter's fuel.

Sometimes they are ill used; and occasionally are most harshly and unjustly punished. Still, their patient, uncomplaining good nature never leaves them, and they are ready again to labor, and suffer if they must, for their master. And when the spring and vigor of their life is over, and before old age comes on, their master fattens and kills them, and makes of them his daintiest feast; though the kindness of a true farmer's heart usually leaves to other hands, and a distant market, this last, unkindest cut of all.

With such close daily associations, it is not wonderful that the farmer loves his oxen, and prides himself on their excellence.

He owes to his own thrift to obtain the best kind, to his good taste that they be fine looking, and to his better nature to use them well.

C. B. Farnsworth, *Chairman.*

COMPARATIVE VALUE OF CROPS AS FOOD FOR CATTLE.

ESSEX.

The committee on the comparative value of crops as food for cattle have received no statement respecting this subject for the past two years. Being chairman of that committee, I have often been requested by several members of the society, to give the result of my experience. I feel extremely reluctant in so doing, not because I am not fully satisfied by that result, but because it differs so much from that of able and distinguished agriculturists in other parts of the State. Nevertheless, if this communication should stimulate others to make further experiments, so that we can arrive at the true value of the different kinds of food for cattle, although they may differ much from

my own, I shall feel fully compensated for contributing the following:—

In the spring of 1850 I sowed forty-two square rods of land to carrots, on which corn was raised for fodder the year previous, ploughing in two cords of well-rotted stable manure. There were sixteen young apple trees growing on the land, which had been set three years; the soil a black, strong loam—the yield was one hundred and fifty-six bushels.

January 1st, 1851, I purchased twelve new milch cows and commenced selling my milk. After the first two weeks, my son observed that he did not have milk enough for his customers by about three gallons per day, and that I had better buy more cows; but, believing, as I did at that time, I could easily increase the milk of my present number one quart each per day, by feeding with carrots, I accordingly ordered the man who tended the stock to commence the next morning, (January 15th,) to give two and a half bushels of carrots to the twelve cows, morning and night, for the next seven days. I then inquired of my son how much the cows had increased, and to my surprise his answer was, not quite two gallons for the week. I then resolved to attend to the feeding myself, and fed the next seven days with hay only. The result was no diminution. I then fed with carrots as before, the next seven days, and there was less than one gallon increase. I continued the same feed alternately for the next four weeks ending March 12th; during which time the cows fell off some in their milk, but not more than one gallon when fed on hay only, than when carrots were added. The hay used during the trial was first quality English hay, with a small foddering of salt hay in the morning. I continued feeding the same kind of hay night and morning, giving at noon as much rowen hay as they would eat in thirty to forty minutes, which increased the milk more than one quart to each cow daily for the next four weeks. By this time I was fully satisfied it would not pay to raise carrots for milch cows, and that I would try some other method.

In April, 1851, I prepared and sowed the same piece of land with onions, where carrots grew the year previous, using the same quantity of manure. The yield was one hundred and sixty-eight bushels, which I sold for forty-seven cents per

bushel, amounting to seventy-eight dollars and ninety-six cents. In November following I bought four tons of shorts in Boston, at nineteen dollars per ton; freight to Bradford one dollar and forty-five cents per ton, making eighty-one dollars and eighty cents, or two dollars and eighty-six cents more than the onions brought. I then had four tons, or about four hundred bushels of shorts, costing but two dollars and eighty-six cents more than the one hundred and fifty-six bushels of carrots. I think the labor was no more to raise the onions than the carrots, and the labor less to feed the cows with shorts than with carrots.

December 1st, 1851, I commenced giving my cows from four to eight quarts of shorts each per day, and continued through the winter, except eight days in February I left off feeding four cows with shorts that had been having eight quarts per day, and measured the milk the first four days. I found they decreased, on an average, three pints each per day. The next four days I fed them with about an equal quantity of rowen and coarse hay, which increased the milk full up to the quantity when fed with shorts.

The next experiment I commenced December 25th, 1852, by selecting three of my best cows, as nearly equal in size, condition and goodness, as I could. No. 1, eight years old, dropped her calf November 25th; No. 2, nine years old, dropped her calf November 25th; No. 3, eight years old, dropped her calf December, 2d.

I continued the experiment eight weeks, giving to each cow the same money's worth of the different kinds of feed, by weight, as the same cost at the time, viz.: shorts, twenty-six dollars per ton; oil meal, thirty dollars per ton; Indian meal, eighty cents per bushel of fifty pounds; rye meal, one dollar per bushel of fifty pounds; giving to each cow fifty-two and a half cents' worth per week, seven and one-half cents' worth per day.

The first week forty-two pounds of shorts were weighed for each cow, and fed night and morning, being about four and one-half quarts each time, wet with six quarts of water two hours before feeding. No. 1 gave, in the seven days, $82\frac{1}{2}$ quarts, beer measure; No. 2, $78\frac{1}{4}$; No. 3, 79. Total, $239\frac{3}{4}$ quarts.

Second week, thirty-five pounds of oil meal were weighed for each cow, wet and fed same as the shorts, being about four quarts per day. No. 1 gave, in seven days, 87¼ quarts; No. 2, 81¾; No. 3, 82¼. Total, 251¼ quarts.

Third week, thirty-two pounds thirteen ounces of Indian meal were weighed for each cow, wet and fed the same, being about three quarts per day. No. 1 gave, in seven days, 85 quarts; No. 2, 84¼; No. 3, 84. Total, 253¼ quarts.

Fourth week, twenty-six and one-quarter pounds of rye meal were weighed for each cow, being about two and one-half quarts per day, wet and fed same as above. No. 1 gave, in seven days, 81¾ quarts; No. 2, 83½; No. 3, 78½. Total, 243¾ quarts.

Fifth week, forty-two pounds of shorts weighed and fed as before. No. 1 gave, in seven days, 76¼ quarts; No. 2, 78½; No. 3, 74. Total, 228¾ quarts.

Sixth week, thirty-five pounds of oil meal, weighed and fed as before. No. 1 gave, in seven days, 82 quarts; No. 2, 84½; No. 3, 81¼. Total, 247¾ quarts.

Seventh week, thirty-two pounds thirteen ounces of Indian meal weighed and fed as before. No. 1 gave, in seven days, 86¾ quarts; No. 2, 89½; No. 3, 84. Total, 260¼ quarts.

Eighth week, twenty-six and one-quarter pounds of rye meal weighed and fed as before.

No. 1 gave, in seven days, 87½ quarts; No. 2, 83 quarts; No. 3, 78¾ quarts. Total, 240¼ quarts.

Three hundred and fifty pounds of English and seventy pounds of salt hay were weighed and fed to the cows each week. When the cows were fed on shorts and rye meal, the whole quantity was consumed. When fed on oil and Indian meal an average of fifty-eight pounds of English hay per week was not consumed.

Cost of feeding three cows two weeks on shorts, $3.15; 700 pounds English hay, seventy-five cents per hundred, $5.25; 140 pounds salt hay, fifty cents per hundred, 70c. Total, $9.10. Quantity of milk for the two weeks, 468½ quarts.

Cost of feeding three cows two weeks on oil meal, $3.15; 584 pounds English hay, seventy-five cents per hundred, $4.38;

140 pounds salt hay, fifty cents per hundred, 70c. Total, $8.23. Quantity of milk for the two weeks, 499 quarts.

Cost of feeding three cows two weeks on Indian meal, $3.15; 584 pounds English hay, seventy-five cents per hundred, $4.38; 140 pounds salt hay, fifty cents per hundred, 70c. Total, $8.23. Quantity of milk for the two weeks, 513½ quarts.

Cost of feeding three cows two weeks on rye meal, $3.15; 700 pounds English hay, seventy-five cents per hundred, $5.25; 140 pounds salt hay, fifty cents per hundred, 70c. Total, $9.10. Quantity of milk for the two weeks, 484 quarts.

It will be seen from the above experiment, that Indian meal possesses the highest value for producing milk; differing, however, but little from oil meal.

Many farmers object to the free use of grain of any kind, believing such food to be too stimulating. But my experience is otherwise. I have twelve cows which for the last five years have dropped their calves in the fall of the year, and have been fed during the winter and spring, till they went to pasture, with as much meal or shorts as were used in the above trials, and were uniformly in as good health and better condition than a like number that dropped their calves in the spring, and had no grain of any kind during the year.

It should have been stated above, that my cows are kept in a tight barn, sufficiently ventilated during the days and nights, except when they are turned out to water about nine o'clock, A. M., and four o'clock, P. M., when they remain out about twenty minutes each time.

WILLIAM F. PORTER, *Chairman.*

The following interesting remarks, on feeding stock, by the Hon. PETER LAWSON, of Dracut, as chairman of the committee on bulls, (Middlesex,) will be found of great practical value:—

The committee have, in former reports, given their opinion in regard to the proper system of breeding. They would now take the liberty to make a few remarks on the system of feeding and treatment, for if the latter is not properly attended to, the former will fail to "satisfy expectation." Obvious as this doctrine must be to every intelligent mind, yet, judging from

the reports of many agricultural societies, as well as from the opinions, and especially the practice of numerous individuals, it seems that they expect that it is enough if they import, or procure in any other way, animals famed for any particular quality, and that they (the animals) should exhibit that quality in its greatest possible perfection, under any system of feeding and treatment, which may suit the convenience or purse of their owner, although it may be the very opposite of that which is best calculated to produce the desired effect. Notwithstanding, if that effect is not produced, then state that the animals have not "satisfied expectation." No reasonable man expects unnatural results. Famers should adopt a system of feeding and treatment suited to the nature of the animals which they have. If such were always the case, we would hear much less about the disappointment of well founded expectations.

In Ayrshire, (Scotland,) where great attention is paid to the breeding of dairy stock, and also to the management of the dairy, their method of feeding is as follows: during the winter months, the cows are fed with cooked food, (boiled or steamed,) twice a day, morning and evening—and this is the case, whether they are giving milk or dry. It is composed of chaff or cut hay or straw, and roots of some kind, potatoes, turnips, or carrots. The roots are broken very fine and thoroughly mixed with the chaff or hay, and frequently bean meal (Indian meal is equally good) is added during the mixing process; water is put in when necessary, and the whole is seasoned with salt. Their fodder, when dry, is generally oat straw, but when giving milk, it is English hay. They are kept comfortably warm and well littered with straw, and combed or carded daily. In summer, they are turned out to pasture, in fields well cultivated on the rotation system. And the cows that run largely to milk, and would become lean in consequence, get a portion of bean meal, oil, or rape cake, to keep them in good condition and improve the quality of their milk.

It will be seen, from the above statement, that the farmers of Ayrshire, in order to realize their "expectations," depend much on the feeding and treatment they give the cows, as well as on their peculiar organization which tends to convert their food into milk.

But it may be said that any breed of cows would produce the same results, under similar circumstances. Any cow or breed of cows, possessing the same kind of organization and size as the Ayrshires, would be likely to do so. But no cow nor breed of cows, however perfectly organized for the dairy, will answer that purpose well, if turned out to pasture in summer, on an "old, dry, worn-out pasture, with a short bite," and get a "bite" of nothing else all day, and in winter tied up in a cold barn (and fed on coarse meadow hay, with perhaps as many roots, "as will do," as the saying is, "to swear by,") where the thermometer will range from thirty degrees above, to as many below zero, where every pore in the skin is shrivelled up, and the circulation of the blood partially, or almost wholly stopped, so that neither it, nor the organs of the body, can perform their natural functions.

This last described system, is a very prevalent one throughout the State, and may be found in full operation even in many parts of Middlesex County, but it will never be highly productive of either milk, beef, or manure; and they will be all of a poor quality, the latter, scarcely worth hauling out. But unphilosophical and barbarous as this system is, it seems to be the one most sought after, for judging from the statements made in agricultural reports, about the productiveness of cows, it seems to be the farmer's boast that he can show with how little food and shelter he can enable his cow or cows to keep life (if not soul) and body together, and yet produce milk. Animals that will produce large quantities of milk under such a system of feeding and treatment, would certainly be more productive under the Ayrshire system, (and throwing humanity aside, as a matter of but little consequence, where the "almighty dollar" is the principal object,) and in all probability more profitable and less likely to "disappoint the expectations" of their owners.

It is of great consequence to the farmer, that he has the breed of animals most suitable for his purpose, for without that, the best system of feeding will fail to accomplish that purpose in the best possible manner. A cow whose form and organization is well adapted for converting her food into milk, will be more profitable than one whose organization tends to

convert her food into manure. The latter may give a greater quantity of milk than the former, and yet, be the most unprofitable of the two, because she will not yield as much in proportion to the value of the food which she consumes. Much has been said and written about the productiveness of cows of different breeds, and of cows of no particular breed, but very little has been said about the cost of the production. If the two statements were placed side by side, a better estimate could be formed of the intrinsic value of the animals. No one breed of cows is adapted in the best possible manner, for the dairy and the shambles; the two qualities cannot be combined in the same animal, their difference in form prevents it.

It will be observed, from what has been stated in the system pursued by the Ayrshire farmer, that he adapts means to ends, and therefore is most likely to have his "expectations satisfied." He gives his cows a liberal supply of dairy food, and in such a state (a large portion of it being cooked) as enables the animal to extract from it more nutriment; and by pursuing this plan, together with punctual attention, the quantity of milk will, in many instances, be doubled or trebled. Punctuality in feeding, is of great importance, as it prevents all uneasiness in the animal on that account; for without a watch, or the knowledge of its use, they know their feeding time as well as their keeper, and as all uneasiness produces a waste of milk and flesh, they should be as punctually attended to and as calmly treated as possible.

The system of the Ayrshire farmer is founded upon sound philosophical principles, and not upon hap-hazard ones. The more we facilitate the adaptation of the food for the organs of digestion, the greater will be the saving to us. He therefore cuts up his hay, straw, and roots, to save some expenditure of force, hence of food, by the feeding animal. If food contains much water at a temperature far lower than that of the animal, it must be raised to that temperature at an expense of part of the food. This is obviated by the process of steaming, and in many cases will prove a saving of one-twentieth part of the food. All feeders of pigs know that they thrive better on dry than on wet fodder. He also provides comfortable accommodations for his cattle, where their blood will circulate freely,

and where every pore of the skin and organ of the body will perform their natural functions.

It is a well established fact, that warmth is equivalent to food. The heat of the animal system is kept up in the same manner as flame is supported—that is, by a union of carbon and oxygen. The animal derives its carbon from the food; which, having undergone digestion, is taken up by the blood, and thence conveyed to the lungs, where, by the act of respiration, it is united with a portion of the oxygen of the atmosphere, and heat is produced. Exposure to a low temperature dissipates the animal heat, just as heat is driven off from any other body similarly situated. It is obvious that the natural temperature of the body must be sustained, or the animal will perish. As carbon is the only material by which this heat can be furnished, that substance must either be supplied to the blood from the fat and muscle already formed, or the blood must obtain it through the medium of food. If the food is deficient, the supply must be made up from a waste of the bodily parts; and the consequence will be, loss of flesh and weight, which, if long continued, may cause the death of the animal, either by finally cutting off the source of heat, or so weakening the system, that it yields to the attack of some malady. To sustain the animal in proper condition, then, requires a supply of food proportioned to the degree of cold to which it is exposed; and it is therefore obvious, that, by avoiding exposure to cold, we save food.

The Ayrshire dairy farmer gives his cows a liberal supply of dairy food, when dry, for if allowed to sink in condition during that period, their milk will be so much diminished after calving as to overbalance the saving effected in their keep. He does a little more than just what will "bring them through the winter." A milch cow must have good board and lodging all the year round, if her owner does not want to be penny-wise and pound-foolish.

We would also draw the attention of farmers to the fact, that animals who have descended from ancestors which have been well fed and well treated, require to be better fed and treated, in order to keep their organization up to its highest point of development, than the same kind of animals whose

ancestors had been badly fed and badly treated, would require, to keep their organization up to its highest point, which might be very low in the scale of organic expansion.

Bulls that are kept for the purpose of breeding, should be fed during the season in which they are put to cows, on nutritious food of a more concentrated nature, than at other periods of the year. The food which would be most suitable for the dairy cow, would not be most suitable for the bull, at the period referred to, as it would produce an enlargement of the abdomen, and otherwise unfit him for the purpose for which he was required at that time. We would also recommend that the act of milking be performed with great caution, or the quantity and quality will be inferior. The milk should be drawn quickly, and not a drop should be left. Whatever is suffered to remain in the udder will be reabsorbed, and no more will be generated than is necessary to supply the quantity withdrawn. There is, therefore, a double loss by the neglect, and of the best milk, too.

HORSES.

WORCESTER WEST.

Report of the Committee.

Your committee have endeavored to attend to the duty assigned them. They suppose the society intend to award the premiums to those horses that best perform the tasks most frequently imposed upon them, that best discharge the most important functions for which they are most usually kept. The horse is one of the most useful animals for the wants of man. He is his attendant in peace and in war, in prosperity and adversity. He carries him to the nuptial banquet and to his last home. The cultivation of the horse in his highest capacity is probably one of the most important considerations which should engage the attention of this society. We have presumed to say, that that horse which, in a light carriage, with a beauti-

ful figure, fine action, and the greatest speed, can perform, daily, during the year the greatest number of miles, and keep in good working condition, all other things being equal, is the best horse. A horse should weigh nearly one thousand pounds, have small ears, well cut and turned head and neck, to give him elegance of appearance, high and thin shoulders that he shall not stumble; large, round, deep chest, and belly that will crave and digest an abundant quantity of food to supply the loss of bone and muscle by vigorous action. He should have wide, strong, but thin limbs, that he may have sufficient action and power, without cocking his knees and ankles or spraining his gambrels. Nothing is less desirable than a small eater—you would of course have a small worker. He should have a small, quick gait, as long strides require more power for the distance than short ones, and carry the carriage with less ease to both rider and horse. All his movements should be easy and elegant, without the use of the check or the art of the driver. Artificial horses, like artificial men, are soon found out, and rate for what they are worth. He should neither interfere nor overreach, but both can be remedied to a considerable extent by shoeing. But a horse that hits badly forward is almost useless as a roadster. A slight slope to the rump changes the angle of the hind legs so a horse can throw the hind feet further forward at each stride, and a short back and high shoulders not only give more strength, but produce the same effect for the forefeet, and prevent stumbling. A round body gives more room for lungs and stomach and shows flesh more readily, and appears better while thin. He should have a sound, vigorous, healthy, active, strong constitution. About the external marks of a good constitution there may be some difference of opinion. For, like man, the breeds are so mixed that we sometimes get the external marks of one breed, and the internal constitution of another. But it is pretty generally admitted that the usual external marks of a good constitution are, large thin legs, deep, round chest and belly, course, heavy mane and tail, black legs and hoofs; and when we find a light sorrel, with white or light thin mane and tail, fine hair, small, delicate legs, light colored hoofs, we usually have a horse that takes cold easy, and has a thin skin that the flies annoy, and that galls badly, and that has a thin shell to his

hoof, and that soon becomes tender in his fore feet by use. Our citizens have paid more attention to the general appearance and the size of their colts, than to their qualities as travellers on the road. From this has resulted that enormous quantity of fat we see piled on to our studs through the winter, that makes them look much like geese fattened for the market. A horse should have bold, high temper that will not brook ill usage without resenting it with indignation to the amount of his ability, and then with kind usage we shall have a kind servant, but one of power. A horse without temper is like a man without spirits, feeble and inefficient.

O. Martin, *Chairman.*

HAMPDEN.

Report of the Committee.

The exhibition of horses has heretofore furnished the most interesting and exciting feature of the second day of our exhibition, but on this occasion it was most sadly reversed. It was not, as Shakspeare has it, "My kingdom for a horse," but most emphatically, my horse for an umbrella, and most fortunate was he who had one without a horse. The pelting of the storm was too severe for man or horse without some covering. Expectation had been elevated to a high figure, in anticipation of a rich display of young horses particularly. The entries which had previously been made were forty-two, including fifty-four animals, many of which were of the most desirable stock. The Morgan, the Black Hawk, Hambletonian, and Kentucky Hunter, were to have been represented by their offspring, but were spared the mortification of having their lineal descendants contend for the poor pittance offered by a small county society, while themselves were being prepared to enter the field of competition for the higher honors and rewards offered at the National Horse Show, the very mention of which still tingles the ear with delight, and deeply does it leave the impress that there is an increasing interest aroused in this county in the improvement of the horse; this we trust is not an ephemerous feeling, but one which will continue to be cherished by the

farmers of Hampden. That interesting exhibition has clearly demonstrated many facts in relation to this stock of domestic animals, which are available by every one interested. A practical lesson has been placed before them, from which they must be thoughtless indeed if they do not avail themselves of some tangible advantage. But we must return to the reports of the several awarding committees at our own show. These, like our exhibition, will be found in unison with the old adage, "a short horse is soon curried."

FRANKLIN.

From the Report of the Committee.

The committee have been much gratified to learn that the interest in the subject of breeding horses has much increased during the past year in this county; believing, as they do, that it may be rendered a source of greater profit to the farmers of this region than it has yet been. The horse that is needed in a business community is, emphatically, what has been called the "horse of all work," and that breed is unquestionably the best which combines the largest number of those qualities which render an animal fit for *various* duties and labors. For these purposes a horse should possess physical strength and endurance for the drawing of burdens and carrying loads, and yet should have lightness and quickness enough for use on the road; above every thing, he should have a sound and healthy constitution, for without this, he must be useless for either of the above purposes.

In breeding horses, it should be remembered that it is as cheap, or nearly so, to raise a good horse as to raise a poor one, if the necessary pains are taken at the start. But nothing can be a more useless waste of time and money, than to undertake to raise good stock from animals which are themselves worthless. The first thing to be regarded, then, is the soundness and health of the animals from which we are undertaking to breed; and, if in that respect, they are unsatisfactory, it is far better to abandon the idea of raising stock from them, than to devote three or four years to colts which will not pay for the

time and trouble expended. In this respect, no greater error can be committed than by those who seem to suppose that if a horse is sound, they may use a mare which is either unsound, or old, and worn-out, instead of a vigorous and healthy animal. For good stock, it is necessary that the colt should be descended from both a sire and dam which are not the victims of any unsoundness or disease, but which have, in themselves, those qualities which are desirable to have transmitted to their offspring. It is true, that good stock is not always raised, when the sire and dam are both good, but in the far greater majority of instances, there can be no question that the stock will partake essentially of the character of its parentage.

CHARLES DEVENS, JR., *Chairman.*

BERKSHIRE.

Report of the Committee.

The committee to whom was referred the ardous yet interesting duty of deciding upon the merits of the animals presented under this division of the show, have been highly gratified in witnessing the increasing interest among the farmers of Berkshire, in the improvement of their horses. We believe that on no former anniversary of this society, has there been so fine a display of mares and colts as was brought before us on this occasion, a fact which we look upon as evidence conclusive, that the zeal that has for a considerable time past animated a large portion of the farmers of Vermont and New York, has found its way into Western Massachusetts; and we trust it is destined here to expand and rise till old Berkshire shall become as famous for the raising, matching and training of good horses, as she already is for her success in the breeding of fine cattle. Our hopes in this matter are based upon the well-known fact that a large portion of the farmers of this community are ever prepared to adopt, and pursue with eagerness, any honest calling that will ensure to them a fair remuneration for the outlay required.

And what, in the line of stock raising, offers a more generous reward than this, where the foal of a few months only, will

command a price varying from thirty to seventy-five dollars; and at a more advanced age, prices are often realized that doubly compensate for all trouble and expense on their behalf. We know that some breeders sell their stock for prices much below these figures, but whenever this occurs it will generally be found to be the result of injudicious breeding. Too many farmers, in our opinion, are in fault in this respect, either from a lack of judgment to guide them to a proper selection of animals from which to breed, or, what is still more to be deprecated, when their judgment is sufficient to direct them to the proper course, they are deterred therefrom by the narrow consideration that the use of such animals is attended with an expense above that required for those of an ordinary character, not considering that the price paid for a good article is almost universally found to be more profitably invested than that paid for an inferior one.

But the question may be very properly agitated, What is the character and style of the race of horses most proper to be bred by the farmers of Berkshire? A solution of this question, satisfactory to the tastes of all, we know to be almost impossible. For, were it put to the sportsman, he would undoubtedly say, without regard to size or form, give me the horse that has the greatest speed, as any one that has not a capacity sufficient for two forty, is beneath my notice. Were it proposed to the drayman or cartman, he would undoubtedly manifest much less regard for the speed of the animal, and decide in favor of the one that has the greatest power of draught. But neither of these decisions are satisfactory to us, as we think a race of animals of this character would not meet the demand of this community; and, occupying the position that we do on this occasion, we trust we shall be pardoned though we give a free expression of our views on this point, asking you to let them pass only for what, in your opinion, they are worth.

We would recommend for size the horse whose weight, when in flesh suitable for labor, is from 1,100 to 1,200 pounds; whose form shall be such as to satisfy the demand of the most tasteful eye; possessed with a constitution that shall enable him, when under proper feed, to endure all reasonable toil that may be

laid upon him; with limbs of medium length and size, supported by cords of full size; with joints not too prominent, but so protected by ligament and cartilage as to secure them against deformity and ruin by spavins or ringbones; with a spirit and power of locomotion that shall secure any reasonable driver against the exercise of impatience when on the road, and with a style in all his movements that shall confirm the truth of the poet, when he said of this noble animal:—

> The steed you pompously bestride,
> Shares with his lord the pleasure and the pride.

And lastly, possessed with courage sufficient to secure him against alarm, and a docility of temper that shall not be excited to resistance though the vehicle to which he may be attached, with all its precious freight of wife, children, &c., should, through the frailty of the harness, or any other casuality, be precipitated against him.

To point the breeders of horses to any race, in which all these qualities are combined, may be a difficult task; yet we believe that embraced under the head of Morgan, approaches nearer the standard we have raised than any other now known to us; and although we may not at present have within our borders any of the very best samples of this breed, we are favored with those of that or of other breeds that have produced a decided improvement in our stock, within a few years past, among which are the "Young Hambletonian," more recently known by the name of "Waterloo," owned by Messrs. Williams and Bright, of Adams, and "Young Black Hawk," owned by S. Hooper, of West Stockbridge. The stock of the former has probably borne off more of the prizes offered by this society, on mares and colts, than that of any other horse yet. We believe his stock may prove better adapted to the labor of the trotting course than that of the farm. He has a number of times been exhibited before this society, and justly partaken of its munificence. The latter has twice been a successful competitor among the stallions presented on former occasions, and although his standing point has ever been within the borders of the State of New York, yet it has not been so remote as to prevent a liberal dispensation of his favors among the breeders of our own county, and favors indeed they have proved, for

his stock, although not any of it is yet fully matured, has almost universally commanded high prices, and in one instance a filly of only three years brought, in the city of New York, the pretty sum of five hundred dollars.

Others have been more recently introduced into the country which bid fair to prove valuable acquisitions to our best of stock-getters, among which is a Morgan horse, owned and presented on this occasion by Homer Winchel, of Lanesboro', and, as the sequel will show, received a favorable notice from the committee.

Our attention was also directed to a three years old colt, named "Morgan Ratler," owned by A. W. Kellogg, of Pittsfield, which we considered decidedly the best on the ground, although not offered for premium. His appearance and pedigree are such as to justify us in entertaining high anticipations of his success as a stock-getter.

MORGAN LEWIS, *Chairman.*

HOUSATONIC.

From the Report of the Committee.

It is a trite and common-place remark, but none the less true that the horse is a noble as well as a useful animal. When we consider his qualities of docility and intelligence,—his symmetry and beauty of form, his wonderful adaptation to the requirements of labor, pleasure or profit, he is ever the same truthful, faithful creature, following us as a companion in our amusement, and facilitating, literally, our progress "along life's beaten track," and cheerfully furnishing sinewy limbs and a broad chest, in the fulfilment of earth's primal curse, as he too feels the trickling of the beaded sweat in the arena of toil.

To-day, he is seen with showy trappings, in all the "pride, pomp and circumstance of glorious war," proudly tossing his head at the sound of the cavalry trumpet, and "snuffing the battle afar off." To-morrow, he creeps slowly and sadly in the funeral van, to the poor soldier's last barrack. He never chafes and frets at want of position. Whether he bears

> "Young Harry with his beaver on,
> To turn and wind a fiery Pegasus,
> And witch the world with noble horsemanship;"

or makes personal and real, our own witty poet's invocation—

> "Ay! gather your reins, and crack your thong,
> And bid your steed go faster;
> *He* does not know, as he rambles along
> That he has a fool for his master,"

the horse is still submissive, faithful and true. All willingly, he jogs the farmer's wife, and the farmer's corn to mill—all willingly he gallops to the wedding or creeps to meeting. With equal willingness he draws the gilded coach, and the unpainted wagon; he saws wood, sails ferry-boats, threshes grain, wins golden cups at the Derby, and drags the railroad car when the locomotive is tired. Saddled or "bare-back," harnessed or unharnessed, bitted or haltered, in rain or shine, in summer and in winter, in the sands of Sahara, or threading with cautious foot the defiles of the icy hill path, he is still the same patient, proud, ambitious, faithful creature, thanking you generously and warmly for every extra measure of oats, and rebelling not, even when his dream of a warm stable, and a well-filled manger, is broken by the crack of a whip, and the stinging of the spur.

Great improvements are being made every year in the breed and quality of horses. Holding ourselves neutral, upon the moral question involved in the temptation and associations of the race-course and trotting-track, it must be conceded that the efforts of horse-men, so called, in the development of great bottom and speed for their own purposes of competition, have also brought out, in a marked degree, those qualities which have rendered the horse a far more valuable servant, than the small, ungainly, and uncombed creature, which sneaked out of the Ark, and was so little regarded in the time of the "Father of the Faithful," that Moses left him out of the inventory, when Isaac administered upon his estate, and carefully numbered his asses instead!

The light and beautiful symmetry of the Godolphin-Arabian, was mingled with the tough, stout limbs of the Flanders mare; the strong-mouthed and heavy-headed French charger, crossed with the graceful Andalusian; the Norman English war-horse,

crossed with the fleet mare of Egypt, in the same age that witnessed the crossing of Richard's two-handed sword, with the Damascus blade of Saladin, and the result has been "Belfounder," "American Eclipse," "Black Morgan," "Lady Suffolk," and "Taconey." Culley's description of a fine agricultural horse, has never been improved upon.

"His head should be as small as the proportion of the animal will admit; his nostrils expanded, and muzzle fine; his eyes cheerful and prominent; ears small, upright, and near together; his neck joined gracefully to the head; his shoulders well thrown back; arm muscular and tapering from the shoulder to meet a fine, straight, sinewy, and bony leg; hoof circular and wide at the heel; chest deep and full at the girth; loins broad and straight, and the body round; quarters long, and tail set nearly in the same line with the back; legs clear and fine-boned, and leg-bones lathy or flat."

The exhibition of the present year, in spite of the great inclemency of the weather, compared favorably with any former exhibition, especially in farm and single horses.

CHARLES HUDSON, *Chairman.*

PLYMOUTH.

From the Report of the Committee.

The committee would beg leave to make a few remarks on the subject of rearing colts. During the first summer, the foals may be allowed to run with their dams until four months old. They should then be weaned and kept in yards containing open sheds, with racks and mangers for receiving their food, which ought to be the sweetest high ground hay that can be procured. Bran or oats may be given, but not to exceed one quart a day. It is a common practice, on weaning colts, to put them into warm stables on plank floors (which is very likely to cause ringbone) during the following winter, from a notion that they are not, at that early age, able to support the cold of an open shed. This idea is unquestionably wrong. From the nature of their future employment, they must necessarily be exposed to every vicissitude of weather, and cannot be too early inured to a certain degree of hardship. Dry

hovels are far to be preferred to warm stables for their shelter the first, second and third winters.

NAHUM M. TRIBOU, *Chairman.*

BRISTOL.

From the Report of the Committee.

And the horse, too, about which your committee are to pass judgment, is by far the most noble and useful domestic animal; and scarcely can there be a spot found upon the whole earth, where civilized man is found, but the horse is also found as his assistant and companion, and rarely can a man be found whose generous feelings are not excited in view of a noble horse; and equally as rare will it be to find a man (and may I not add lady also) whose blood does not boil with indignation, when a greater brute (in the form of man) is guilty of cruelty towards him. No matter how many other modes of conveyance may be invented, the horse will always be the servant of man.

It seemed to be supposed by many, that the application of steam-power in moving the vast amount of freight and baggage over the country and to our cities, would lessen the demand for horses as beasts of burden, and that they would decline in price, but the contrary is the result; for a very great portion of the freight, bagga ge, and passengers which are carried by steam, do not arrive at their exact place of destination without the use of horses, and both demand and price have largely increased.

C. LEONARD, *Chairman.*

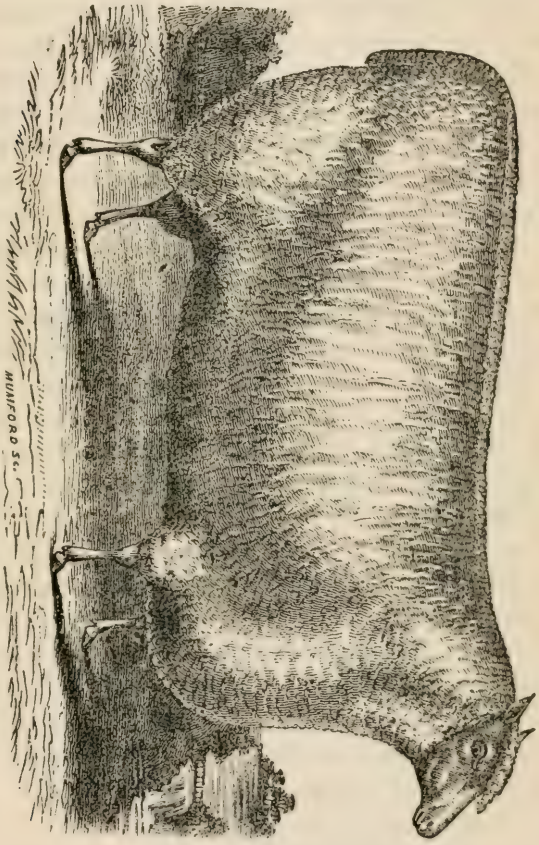
SHEEP.

FRANKLIN.

From the Report of the Committee.

Fourteen entries were made, of South Down, Irish Smut, French and Spanish Merino, and Silesian variety—all of which specimens were of great excellence.

In regard to fine woolled bucks, the committee find it very difficult to decide satisfactorily, even to their own minds. The recent introduction of the French Merino and the Silesian varieties may prove to be a great acquisition to our sheep husbandry, but we think they have not been sufficiently tested to warrant us in recommending them too strongly to our farmers.



NEW OXFORDSHIRE, OR IMPROVED COTSWOLD RAM.

A Silesian buck, entered by Thomas J. Field, which sheared eighteen and a half pounds of unwashed wool, of two years' growth, had the finest fleece of any on exhibition, the weight of the fleece having been considerably diminished in consequence of his having been imported during that time. A lot of French

Merino's, both ewes and bucks, entered by Aaron Buddington, showed great skill and judgment in selecting and rearing this kind of sheep.

The exhibition of fine woolled sheep was very creditable to their owners. A lot of five Spanish Merino ewes, entered by David Dennison, the committee regard as of superior excellence; but as the society's rules required the entry of six, we could not, of course, award to him a premium, but would recommend a gratuity of a volume of the Report of the Commissioner of Patents. An Irish buck, belonging to Dorus Bascom, of Gill, estimated to weigh two hundred and fifty pounds, being four years old, is a noble animal, and we recommend a like gratuity to Mr. Bascom, of a volume of the Commissioner's Report.

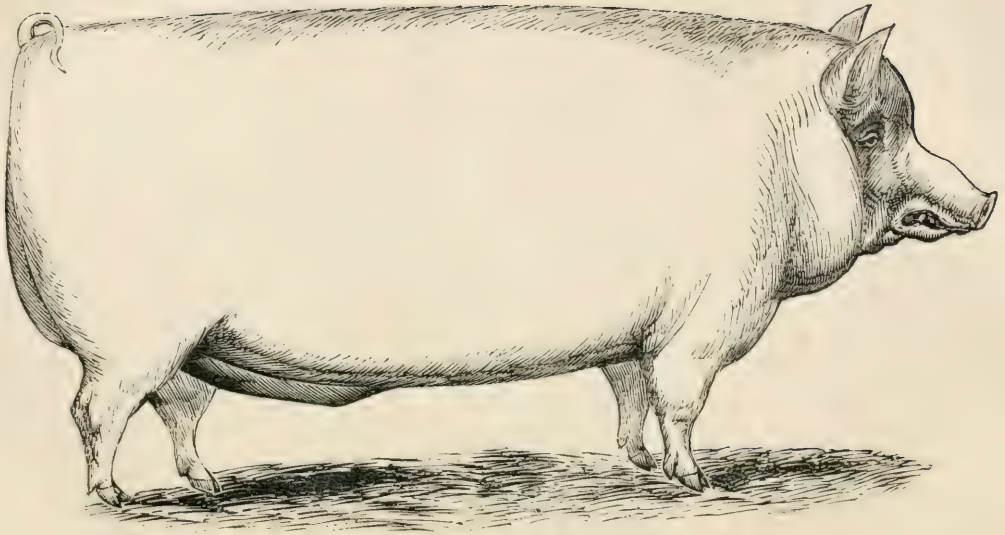
The specimens of South Downs exhibited were very gratifying to the committee. Where all are so superior, it is difficult to discriminate, and we cannot too strongly recommend to our farmers, increased attention to this variety of sheep. The statistics of sales and profits furnished by their owners would seem calculated to induce a general rush for the business.

The following are samples:—Samuel Fisk sold thirty-four lambs from twenty ewes for $4.25 per head—sold in August. William Wood sold thirty-seven from thirty-five ewes for the sum of $175—sold in August—bringing $5 per head for twenty-five, and $4 per head for twelve.

The exhibition of sheep, this day, seems to have exceeded those of this society heretofore, both as to numbers and quality of animals; and yet the committee feel compelled to express their regret that there is not a more general interest manifested in raising and improving this valuable stock in Franklin County. They believe that a large portion of this county is well adapted to this branch of husbandry, and if our farmers would turn their attention more to it, the aggregate income of the county would be greatly increased.

All which is respectfully submitted.

R. H. Leavitt, *Chairman.*



IMPROVED SUFFOLK BOAR.

Bred by Dr. Morton, Etherton Farm, West Needham, Mass., for which the *First Prize* was awarded by the Norfolk Agricultural Society, at the Exhibition, 1853.

BERKSHIRE.

From the Report of the Committee.

There were twenty entries of fine wool sheep for the society's premiums, all of which were excellent specimens, and richly deserving the society's bounty. The committee were unanimous in awarding the premiums. The committee were very favorably impressed with the exhibition of sheep by Mr. Stockwell, of Vt., as being just the kind adapted to our climate, and to the wants of our people, and suited to the requirement of the manufacturer, carrying a fine heavy fleece, free from gum and oil.

Your committee were unanimous in recommending some modification in the rule in awarding premiums on fine wool sheep; that giving premiums on fine wool alone without any regard to form or size, ought not to be encouraged by the society.

There may be differences in opinion as to the variety of sheep that are the most profitable, but as the main object is to make money, your committee are of opinion that the best test is to ascertain the variety that will give the greatest proceed from a given amount of feed, or in other words the greatest proceed from a given number of acres.

Your committee are aware that location may make some difference, but they now speak for our county, where the growing of wool and meat is combined.

S. HUBBELL, *Chairman.*

SWINE.

WORCESTER NORTH.

From the Report of the Committee.

The committee are deeply impressed with profound gratitude at the high honor which has been so spontaneously, and without solicitation on their part, conferred upon them. They boldly assert, here in their place, that they have sat in judgment upon one of the most useful classes of animals in the

whole catalogue. What else affords such agreeable, such wholesome food—is preserved by salt so easily in all climates—is procured and reared with so little expense, and when fairly packed in the family pork barrel, sends such a spirit of independence to every member thereof? Let old winter come in all its frigidity—old boreas blow his creaking blast, till not a single autumnal leaf shivers to the breeze, the happy bipeds who gather around the cheerful fireside of "sweet home," from parents to four-year-olds, can sit at the family fire place (would that we had more of them) and complacently look at back-log and fore-stick, hear the joyful serenade of snapping during the longest winter eve; raising their thoughts, their emotions, their gratitude to that Source from whence all our blessings flow,—which always adds dignity and elevation to humanity,—for why? there are layers enough still left in the barrel of this nutritious food, till spring time and harvest.

The committee will now indicate what they deem the essential characteristics of a good hog. He should not be too long, full in the head and cheek, short neck, good round carcass and full quarters. Formerly the Berkshire breed was preferred, but now it is believed that a cross with the small Chinese breed is the most profitable, they being susceptible of considerable weight, with comparative light feeding, while the cross has produced a more mild disposition in the animal.

Your committee deem it their duty to urge upon every family that has a small patch or garden, to rear their own pork. The public have but a vague, imperfect idea of the large sums of money which might be saved by substituting hogs for dogs. In the expense it will be less, while, by a little care and economy, by the saving the wash or swill, the weeds of the garden, and surplus vegetables, adding a little corn meal at the end, they may eat their own pork, in lieu of eating as they do, many times, the rattlesnake, beech-nut pork of the West. Our native born citizens may well take a useful hint from our Celtish brethren, with their clean, well-washed pigs, well-secured pig-stys, and potato patches to feed them.

To the farmer, they would say, build warm, comfortable hog houses, which shall shelter this abused animal from our keen wintry winds, and he will pay you for it in additional pork.

Commence to breed largely from the most approved stock, upon a large scale. The little grunters will always sell to profit. Instead of fatting four or five hogs a year, you can about as well fat forty or fifty, and let us have the pleasing, the profitable reflection, here in this part of the county, that, let others do what they will, here we save our own bacon.

A. Crocker, *Chairman.*

HAMPSHIRE.

From the Report of the Committee.

The show, as a whole, has been a very good one. The several varieties of swine, for which a premium was offered by the society, have been well represented, as have also the different breeds most esteemed in this region. Some specimens, however, appeared to be of such a mixture of breeds, that it would puzzle a farmer, and probably any body else, to trace their genealogy, or to call them any thing but hogs.

The best and cheapest mode of producing the best pork, is a subject of very general interest. Probably, more families within the limits of our society participate in the production of pork, than of any other variety of meat. And the same remark is doubtless true, in regard to most country towns in New England, and throughout the United States. Every step of progress, therefore, in the selection and improvement of breeds, in determining the most suitable food, the best and most economical mode of its preparation, and the best general treatment of swine, is an advantage shared directly by large numbers. And it becomes us, in this part of the United States, especially, to look well to this matter, that it may be profitable for us to produce pork for market. The quality and mode of producing it must be superior, or our western brethren will supply our markets, and even our next-door neighbors. The farmer who lives a thousand miles from Boston, and produces his corn (doubtless the best food for fattening swine) on the cheap and fertile soil of the West, at a cost, varying from sixpence to fifty cents a bushel, can now, in many cases, by the aid of railroads, transport his pork to that city for about the

same sum that it used to cost our fathers, twenty or thirty years ago, to take it to the same market.

Notwithstanding the odds against us, pork has been, and will probably continue to be, produced among us at a profit. But it can be done only by good management, and by the production of a superior article. The circumstances surrounding the Massachusetts farmer—whose corn is worth a dollar a bushel, and who expects to rear and fatten his pork in a pen of moderate size, with a small yard connected, and to feed them with the refuse of the dairy and kitchen, and with a variety of other food, raw and cooked—are quite different from those of his western brother, who rears his pigs on the prairies or oak-openings, and fattens by turning them into his corn-fields. What would be wisdom in one case, might be folly in the other. The breed of swine, for instance, that would be profitable for one, might be poorly adapted to the purposes of the other. This may be illustrated by reference to the last Agricultural Report of the United States Commissioner of Patents. Before preparing the report, the Commissioner had sent a circular to various parts of the United States, in which he proposed this question, among others, "What are the best breeds of hogs?"

New Hampshire answers, "the Suffolk;" Connecticut, "a mixture of 'old fashioned hogs' with Berkshire and the China breed, generally does very well;" New York, by three of her citizens, separately, "Berkshires and Leicesters;" New Jersey, "a cross with the Berkshires;" Pennsylvania, "a cross of the Berkshires and Chester County;" Virginia, "Irish Grazier and mixed Berkshires are our common stock;" Georgia, "the best breeds for the climate are the Woburn and Grazier;" Mississippi, "the best hogs I have tried are the Berkshires;" Texas, "Irish Grazier;" Tennessee, "the common old Grazier mixed with the Hindoo breed;" Kentucky, "Woburn;" Ohio, "Leicester, Bedford, Chinese, and Calcutta;" Michigan, "the Berkshires are too small, and are nearly extinct. We have the Byfield and Leicester;" Indiana, "Berkshires, Russia, and China;" Missouri, "Berkshires, or a cross between the black Berkshire and white Irish;" Iowa, "China and Byfield. Berkshires are not much esteemed of late;" Florida, "for the range, or shift-for-yourself system, the long-nosed Pike stands A No.

1. For a system of partial feeding, the Corbet, grass, and a cross with the China hog are preferred."

It is doubtless true, that in some cases, a knowledge of the different breeds would have led to different answers. But it is quite as true and evident, that no one breed is best adapted to all locations and circumstances.

The same report may also be cited to show the different results obtained by various individuals, as to the weight of pork produced by a given quantity of food. A question proposed in the circular was, "how many pounds of meat will one hundred pounds of corn yield?" Comparatively few of the responses definitely answer this particular question. But those given, vary from eight to forty pounds. Now if there be, in fact, so wide a difference as these answers indicate, it appears to us that it must be, in a great measure, owing to the causes before suggested; such as adaptation of the breed to the circumstances of the farmer, and the modes of rearing and fattening. The Commissioner, in a note appended to the 301st page of the report, expresses his own opinion, that "one hundred pounds of corn-meal ought to produce twenty-five pounds of pork," and he adds, that "three and a half pounds of meal gave Mr. Ellsworth, former Commissioner of Patents, a pound of pork." This last would be twenty-eight and four-sevenths pounds of pork to one hundred pounds of meal. If the farmers of Hampshire County can attain to Commissioner Ellsworth's success, we need not fear that pork cannot be produced at a profit, in the Connecticut Valley.

SAMUEL NASH, *Chairman.*

FRANKLIN.

From the Report of the Committee.

The English alphabet probably affords no three letters which, united, are more significant than those which compose the word hog. The word swine is altogether too chaste and classical to impart a correct idea of this animal. We are aware that the word hog is not used in Scripture, but without

going into any nice biblical philology, we contend that this uncouth, outlandish, three lettered monosyllable, would better express the opprobrium which all the sacred writers seem to have attached to this animal; we say opprobrium, for the first authentic mention of swine is in connection with the defiled meats prohibited by the Mosaic law; and the last, is where a legion of devils drove a herd of two thousand down a steep mountain, until they were choked to death in the bottom of the sea.

We have glanced at profane history with little better success. Goldsmith, in his "Animated Nature," and Buffon, in his "Natural History," both speak of this animal as a glutton, sordid and brutal in his domestic state, whose sensations are as gross as his shape is unsightly; destitute of attachment, incapable of instruction, his whole life being divided between sleep and gluttony.

Yet the swine has outlived the *higher law* of Moses, the rude attacks of Goldsmith and Buffon, until he has become, in our domestic economy, an animal second in importance only to the cow; whilst in the market it is one of the great staples of the world. The family circle is now incomplete without a pig; the farmer, with small means, would almost as soon part with the crib and porringer of his last responsibility, as the cozy pen and trough of his little grunter, to which he looks for future subsistence. More secure than lands and houses, the law itself exempts from attachment one of these animals for every family.

The first thing in rearing swine is to select the right breed. The Suffolk, or a cross between that and some other, is probably the best. You might as well try to find a miser's name on a subscription paper, as to undertake to get the first quality of pork from a long-legged, long-eared, long-nosed, large-boned, rawny hog; whilst the opposite qualities, with good feeding and attention, will ensure fine meat. Hogs should have regular meals to fat well; unless this is done, he will "squeal off flesh" about as fast as you can put it on. The Irishman fed his pig every other day, and when asked the reason, said he liked streaks of lean and fat together.

The trough of the swine should be kept clean; he wants no

knife, fork, or spoon, no napkin or table-cloth; but, as has well been said, "he likes a clean plate."

The hog-pen is quite as important to the swine, as the dining-room, parlor, or bed-chamber to man. There is more ignorance and unpardonable animal abuse on this subject than on almost any other; we do not now speak of the yard, which should be large and roomy, but the pen should be well built, dry, airy, well floored and roofed, and constantly supplied with fresh litter. It is indispensable that hogs should have a clean, dry, comfortable, wholesome lodging place.

On the subject of food, no uniform rule can be laid down. It must depend upon the situation and circumstances of each particular case. Corn will, of course, always be an important element in the food of fatting hogs; but apples, boiled and mixed with meal, or boiled potatoes, will be found very nutritious and profitable, especially where orchards are so abundant as they are with us. Store hogs will eat almost any and every thing; and the proper and profitable management of them will tax the ingenuity, patience and industry of the farmer; weeds, corn-stover, the wash of the dairy and the table, small potatoes, windfalls and other poor apples, beets, and corn, unfit for other purposes, may all be turned to the best account with store hogs.

Manure is one of the most important objects in the business of swine rearing. This is the great point where so many of our farmers fail. By proper management store pigs will pay for their keeping by the manure they make. Why so many barren, unproductive farms? What need of such scant crops of hay and grain, within a stone's throw of your hog-pen and yard? None, whatever. If the hog-pen cannot be constructed to connect with the barn, stable, and yard, then build a good large yard to connect with the hog-pen; cart in muck, peat, leaves, straw, dirt, and refuse, and decayed vegetation of all kinds; repeat the experiment as often as it will answer. Let your young litters in upon it, to practice the maxim, "root, pig, or die;" and as the sports and pleasures of pighood begin to decay, and the sober realities of hoghood and old age come stealing on, let the older members of the family understand that life to them is short, and whatever they do, either for their

own comfort and growth, or to enrich their owners, must be done quickly. Many cords of manure, now so scarce and valuable, may thus be made every year by a few hogs, and in good time all our homesteads and farms be made to exhibit new evidences of productiveness and beauty, thrift and profit.

Most of the swine exhibited partook more or less of the Suffolk breed. We believe great improvement may be made in this county in rearing swine; and we trust that future exhibitions will present, if not better, at least specimens more numerous and in greater variety.

W. Griswold, *Chairman.*

BERKSHIRE.

From the Report of the Committee.

The Berkshire farmers have this year presented your committee with a "feast of fat things."

Twenty-three entries were made, each one of which was highly creditable to its proprietor. The committee were unanimously of the opinion that a finer display of swine has never been made in the county, and they are happy to infer from this exhibition that our farmers are devoting that care to this department which its importance so well merits.

Of the different breeds presented to the inspection of your committee, we are inclined to favor a cross of the Suffolk with our common swine, as likely to produce the best and most profitable pigs.

Robert W. Adam, *Chairman.*

NORFOLK.

From the Report of the Committee.

Probably no county in the State can show so good a stock of swine, as can the County of Norfolk, diligent care having been taken in the selection and importation of the choicest breeds in vogue.

Although the number shown was sufficient to fill nearly all

the pens, and the swine were, in every instance, excellent, still the amount intended to have been shown, would have trebled those on the grounds, had the weather proved propitious. The committee learned from many individuals, known to be good breeders of the "Improved Suffolk," that the pigs were boxed to be forwarded, but detained over till the second day, hoping for more favorable weather.

As previously stated, nearly all the swine were of the "Improved Suffolk," or that stock largely crossed with the Middlesex or the Mackay. In order, therefore, more fully to illustrate the value of such breeds or varieties as are generally brought to your grounds, they give a lengthy extract from the admirable paper on Swine, drawn up by Sanford Howard, Esq., a writer whose opinion on stock is not second to that of any other writer.

"The following is a brief notice of some of the breeds of domestic swine. It is only a few years since it was very common to hear an expression, signifying that the breed of a hog is in the food he gets. This notion has been, to a great extent, eradicated, but it is not yet without advocates. There are still some who do not believe there is any thing in the breed, because they 'cannot see how it is;' but that is no reason for denying the fact. They cannot see how it is that in the seeds of a fruit, (as of the pear, for instance,) all of which are, to outward appearances, just alike, and probably would appear so by the nicest chemical test, some will produce fruit the most delicious and melting, and others, with precisely the same soil and culture, that which is the most crabbed and austere. They cannot see how it is that the bear should line and cover his carcass with fat to an amount nearly equal to half his whole weight, and which supplies his lamp of life for five months in the year, while the wolf and the fox remain gaunt and lean. They cannot see how it is that the same kind of food, when eaten by the ox, the sheep, the turkey, or the common fowl, produces meat, which, to human taste, is of very different qualities.

"All these effects are obvious; yet we cannot see their causes, nor fully understand them. All we can say is, they result from the varied nature of things. They show, however, that there is in the original germ of plants and animals, a

principle which produces certain peculiarities greatly affecting their value, for the purposes of man. This principle is not only manifested in the characteristics of different species, but exists more or less in varieties of the same species. We see its effects in the different kinds of wheat, and in other species of grain—in varieties of peas, beans, apples, potatoes, &c., and in the peculiarities of the different varieties of the dog, the sheep, the hog, and other domestic animals. It is man's business to study these peculiarities, and secure and apply them in those ways which will render them most subservient to his wants.

"In regard to swine, it is to be regretted that the difference in the various breeds has not been demonstrated by exact experiments. We are, however, in possession of certain facts of great importance in the case. For instance, many farmers have found, that on the same amount and kind of food, some hogs will gain much faster than others; that some will become fat on uncooked vegetable food, as raw apples, while others require grain or meal to bring them to a slaughtering condition; that some will keep in good order, and will thrive on clover or grass only, while others can scarcely live on such fare; that in some, the tendency to fatten is so great, that it is necessary to keep them on very low diet to insure their breeding.

"There is not only a difference in the amount of meat which different swine are capable of acquiring from an equal amount of food, but there is a great difference in the quality of the meat. Some persons, doubting this, may say, 'pork is pork,' so 'beef is beef;' but is there not a great difference in the texture and flavor of beef from cattle of different breeds? This difference is so well understood in England, that the prices of beef are, to a considerable extent, regulated by the breed—the West Highlanders and Galloways taking the first rank, then the Herefords and Devons, and last, the Short-horns. A similar scale of prices regulates the market in reference to mutton from various breeds of sheep. The difference in the meat of swine is not less striking. Some have a thick skin, with flesh of an open, coarse texture, and unpleasant flavor; others a thin skin, with fine-grained, well-flavored flesh. Some convert their food almost wholly into fat, while in others it enters chiefly into

the composition of muscle. In some, the fat is accumulated chiefly on the belly, and is of a soft, oily nature; in others, it is laid more on the back, and is comparatively firm and hard.

"Of course, the breed should be chosen with reference to the purposes in view. If lard-oil is the principal object, the animal which will give the greatest quantity of soft fat for the food consumed will be most profitable. For barrelling, 'clear pork' is the main object; and the animal which will give the greatest quantity of solid fat on the back and sides, is preferable. This is the description of pork which is chiefly consumed in the Eastern States and in the fisheries. In the Southern and Western States, pork is used chiefly in the form of 'bacon'—the whole of the meat is 'dry-cured' and smoked. Where this is the object, the clear fat which is so much prized in other cases, is not desirable; but a carcass which gives a considerable proportion of lean with the fat is much better.

"The swine of the United States have been derived chiefly from Great Britain, though occasional importations have been made from other countries. The British stock of the present day consists of various mixtures of the aboriginal race of that island with various Asiatic stocks—mostly Chinese and Siamese. Youatt, in his treatise, published in 1846, observed that the old breeds were 'rapidly losing all traces of individuality under the various systems of crossing to which they are subjected.' The old stock, which, 'with trifling degrees of difference,' it is said, 'was spread over the greater part of England,' is described by Martin as 'large, coarse, unthrifty, with a long, broad snout, large flapping ears, low in the shoulders, long in the back, flat-sided, long in the limbs, and large-boned, with a thick hide covered with coarse bristles. They were enormous feeders but slow fatteners; consuming more food than was repaid by their flesh.' But he observes that the 'general system of crossing now pursued tends to the establishment of a uniform race throughout every country; that is, a race presenting the same outstanding characteristics."

Another eminent and judicious writer, speaks as follows:—

"A leading principle in breeding this animal,—and it applies equally to the horse, the sheep, the ox and the dog,—is to make a cautious selection of the male by whom the female is

destined to conceive her first progeny, for that male stamps a character upon every subsequent produce (whether for good or bad) by other males; "The subsequent progeny of the mother will always partake more or less of the character of the father of the first offspring." This law is mysterious, but it has been abundantly proved, (see Giles, in *Philosophical Transactions* for 1821,) and need not be here further insisted on; the fact is established. The selection of the male, then, is of primary importance; of whatever breed he may be, he should be as perfect as possible in the good qualities of his race; he should be free from all blemishes, and be, moreover, the offspring of parents in all points unexceptionable. A young boar, intended for breeding from, should be kept separate from the sows until about a year old, when his physical energies will be fairly developed. Form is of more importance than size; in this latter respect the breeds differ, as they do, also, in the size of the ears, which in some breeds are flapping, especially in those which incline to the old stock. Good pigs, it is true, may show such ears, but small, sharp, erect ears accompany what may be called blood. In a well-formed boar the barrels should be rather long and cylindrical, the limbs should be small in the bone, the hoofs neat and compact, the skin should be rather loose and mellow, with the bristles fine but scanty; the snout should be short and sharp, the forehead rise boldly between the ears, and merge into an arched neck; the back should be straight and broad; the hams rounded and ample; the chest should be wide, indicative of the amplitude and vigor of the vital organs; the tail should be slender, the eyes should be lively, the temper or disposition cheerful, without moroseness. As to color, some breeds are black, others are white; but we think that black pigs are thinner in the skin, and are, moreover, less subject to cutaneous affections.

"Equal care should be taken in the selection of a breeding sow as of a boar; she should be of good stature and form, sound, healthy, and free from defects; she should have twelve teats, at least; for, as may be observed, each little pig selects its own teat, and keeps to it, so that a pig not having one belonging to it would in all probability be starved. A sow not pregnant, whose belly hangs low, almost touching the

ground, seldom produces large litters or fine pigs; the pendulous condition of the abdomen is the result of weakness and relaxation from ill-feeding and ill-breeding, neglect, with other causes, and is generally accompanied with flat sides, a long snout, and a raw-boned, unthrifty carcase, yielding coarse meat which will not repay the outlay of feeding.

"Early breeding not only weakens the sow, but, as her physical powers are not yet fully developed, results in the production of undersized weakly pigs, and perhaps, incomplete as to number; and these, perhaps, she will scarcely be able to nourish. A young sow of good stock, who produces a large litter at her first parturition of pigs, all of equal size, and proves a good nurse, is valuable; she promises well, for her first litter may be taken as a sample of those to succeed. As long as such a sow continues to return to the breeder such litters twice a year, he will do well to keep her, more especially if he finds, upon trial, that her progeny fatten kindly, whether as porkers or bacon hogs. Some persons, after obtaining one or two litters from a sow have her spayed, and then fattened off as quickly as possible for bacon. Some keep to their second or even third year of breeding; but if the last litter was good, and the sow continues vigorous, it becomes a question how far it may not be more advantageous to keep her still longer, even until the diminished number of pigs produced indicates a decline in fruitfulness.

"Cold, sleety weather, with keen winds, is very detrimental to young pigs, and not favorable to their mother; hence, early in the spring and late in the summer, or early in the autumn, are the best periods of the year for the production of the litter. In the spring the fields and paddocks offer fresh grass and various vegetables, and a run upon the pastures will not only be a saving to the farmer but of benefit to the young pigs; besides which, at this season of the year, whey and buttermilk are abundant, and so continue to be during the greater part of summer. An autumn litter, again, will have sufficient time to grow and acquire strength before the severities of midwinter; besides, the refuse of the potato crop, and the carrot beds of the garden generally, and of the mill, is now at hand in abundance.

"A breeding sow should never be overfed; not that she should be starved—on the contrary, she should be kept, by a judicious allowance of food, in good condition and perfect health, but not fat. A sow when fat is not likely to be fertile, and moreover, her parturition is sure to be more difficult and dangerous, and her milk in insufficient quantity, perhaps even of inferior quality, while her unwieldiness renders her more liable to overlay her young. When with pig she should have a commodious and clean sty to herself, and be supplied with sufficient straw to render her comfortable. She should be sufficiently fed, and all her wants supplied. All sources of irritation or annoyance should be avoided, and especially as the time of parturition approaches. From these causes—sometimes, perhaps, from craving hunger—a sow will devour her young; it is said, also, that if she be allowed to devour the after-birth, a morbid appetite, leading her to fall upon her litter, will be engendered. For these reasons the sow should be carefully watched and fed, especially if the parturition be her first; and not for these reasons only, but lest her parturition should prove dangerous or in any way difficult.

"On no account should two pregnant sows be placed in one sty, however commodious. They will assault each other, and at last, perhaps, destroy each other's young.

"'Selection, with judicious and cautious admixture, is the true secret of forming a breed.' It is thus that all our improved breeds of domestic animals have been produced, those of the hog not excepted. Hence, the old, coarse, large-boned swine have now almost disappeared, and given place to small-boned breeds, apt to fatten, mature at an earlier age, affording more delicate meat, less expensive to keep, and, therefore, altogether more profitable. Such breeds are rapidly extending themselves, and improvements are going on. Many landed proprietors pride themselves on the possession of a particular breed of their own establishment, and remarkable for good qualities of every kind. In the establishment of such a stock, indiscriminate selection, and a repetition of crosses, with no definite object, must be avoided; while, at the same time, a pertinacious adherence to the plan of breed-

ing in and in from the same stock, however excellent, will ultimately result in its degeneracy. Comparatively speaking, it is only within a few years that the improved breeds of pigs have risen up to reward the skill of the breeder. The Chinese or Siamese, the Neapolitan, and the African varieties, have greatly contributed to their creation, and continue to modify those in which a farther cross is desirable. After one or two crosses, the best progeny is generally selected to inter-breed again with the original stock, and thus is its improvement effected."

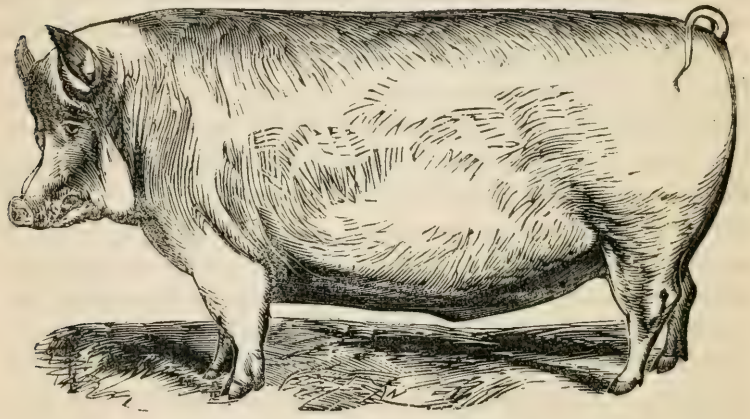
The writer first referred to, thus continues:—

"Before proceeding to notice the various breeds of swine, it may be observed that the general wants of the community, in relation to pork, can be best supplied by two descriptions or classes of hogs; one for supplying the market with meat to be eaten fresh, and for baconing, as above mentioned, and the other for making fat pork for barrelling, &c. This classification will therefore be adopted in the remarks which follow. Those breeds whose special characteristic is the formation of fat, will be first considered. And, as having been the principal stock in changing the character of the Old English, we will notice first of all,

"*The Chinese.*—There are doubtless various breeds of swine in the 'Celestial Empire.' Specimens brought from that country frequently present so marked a contrast of character that no one would hesitate to pronounce them of different breeds. They vary in size and in color, ranging from white to black. Some of the early importations made to England, and thence to this country, were black; and the idea appears to have been held that this was the invariable color of Chinese swine. Hence Culley, who wrote in the year 1784, speaks of them as 'the Chinese, or black breed.' Youatt makes two distinct varieties of the Chinese, the 'white' and the 'black.'* The race, however, in all its varieties, possesses the common characteristic of fattening easily. They are small-boned, and

* It may not generally be known that the progeny of the white hogs transported from Europe and the United States into the tropical regions of Africa and America are usually black, and continue of that color through successive generations. How far this will explain the differences in the color of the Chinese hogs, a series of physiological inquiries can only determine.

acquire great weights in proportion to the bone and offal. Those brought from their native country seldom have that perfection of symmetry which is most esteemed in animals of this kind, and which the cross-bred descendants soon acquire by skilful breeding. The pure Chinese fatten too much on the belly and too little on the back, and the fat is inclined to be soft and oily. Youatt says: 'They do not make good bacon, and are often too fat and oily to be generally esteemed as pork.' The females are sometimes singularly prolific. The improvement which has been effected by means of the Chinese race, has resulted, in the first place, from lessening the bone and increasing the aptitude to fatten in the stocks with which they have been crossed, and afterwards selecting, as a breeding stock, such as possessed the requisite points as to symmetry.



IMPROVED SUFFOLK.

"This breed is one of the most highly esteemed and valuable in the world. Its origin, according to Youatt and Martin, is the old Suffolk crossed with the Berkshire and Chinese. Youatt says: 'Those arising from the Berkshire and Suffolk are not so well shaped as those arising from the Chinese and Suffolk; being coarser, longer-legged, and more prominent about the hips.' He concludes: 'On the whole, there are but few better breeds in the kingdom than the Improved Suffolk.' He states that the greater part of the pigs at Prince Albert's farm, near Windsor, are of this breed. Martin says: 'This breed stands

first,' and he describes the animals as 'rather small, but compact, short-legged, and small-headed; the body is round, and they fatten readily.' Rham, in his 'Dictionary of the Farm,' says: 'Suffolk pigs are perhaps, on the whole, the most popular of any breed in England.'

"For the introduction of the Improved Suffolk pigs into this country, we are indebted to the late William Stickney, of Boston. He made several importations, comprising some of the best specimens of the breed to be had in England, from 1842 to 1848. He also imported specimens of the Middlesex and of the White Essex breeds. Since these importations, there have been others, and the stock is now bred to a considerable extent in New England, and is rapidly spreading over the country.

"The Suffolks, as before stated, are not large hogs, but attain maturity at an early age, and may be always in condition to kill from the time they are a month old. They readily weigh from two hundred to three hundred pounds at six to ten months old, and a proportionate weight at twelve months. The pork is so much esteemed, that it generally commands from a cent to two cents a pound, extra, in Boston market.

"*The Middlesex.*—This appears to be a popular breed in parts of England, and has sometimes carried prizes at the shows of the Smithfield Club. It has been previously stated that Mr. Stickney imported Middlesex pigs into this country. He received a lot in 1844, and another lot in 1848. The breed is evidently derived from a large infusion of the Chinese with some larger stock. Our remarks refer to those introduced here. The color is usually white. The size of the animals is perhaps somewhat larger than the Suffolk, but the carcass is less symmetrical; the frame is more loose, the legs less straight, the knees apt to be turned in, the belly is more hanging, and the general appearance indicating a softer texture of flesh. They fatten easily. They have often been crossed with the Suffolk, but with no advantage to the latter, so far as the writer has seen. The late Mr. Stickney, continued the stock unmixed for several years; but it is not known to be so bred by any one in this country at the present time.

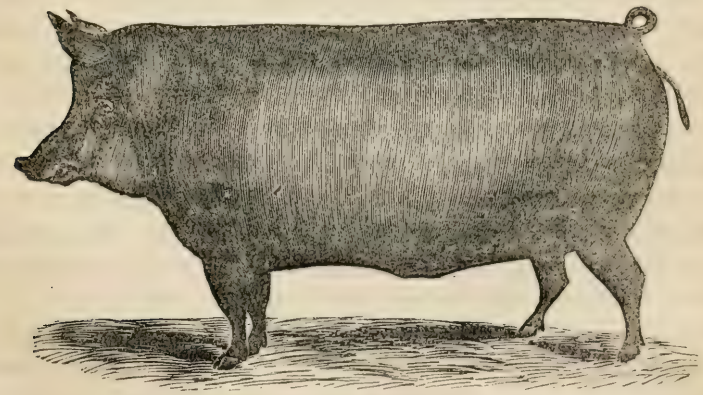
"*The Mackay Breed,* formerly well known in Massachusetts,

was originated by the late Captain John Mackay, of Boston. He had a farm at Weston, in Middlesex County, on which he collected many hogs which he procured in various parts of the world, whither he was led in his commercial intercourse. These various kinds were bred together, and the result was the production of a stock to which his name was applied. The writer of this article purchased pigs of Captain Mackay at various times—first in 1830. It can hardly be said that his stock ever acquired a sufficiently uniform character to justify its being called a distinct breed. Their greatly diverse origin was always more or less manifest. They were, however, very easily fattened and highly profitable. Some inclined to grow to a large size, yet were always fat, from three weeks old, if tolerably cared for; and at eighteen months old sometimes weighed six hundred pounds each, and upwards. In the latter part of his breeding, Captain Mackay gave his attention more to the propagation of this larger stock. In 1834, he sold all his swine to Colonel Jaques, of the Ten-Hills Farm, who now has all of this valuable stock within the writer's knowledge. Various circumstances, which it is unnecessary to mention here, have conspired to nearly annihilate them. Colonel Jaques has made extensive inquiries, but can hear of none except those in his own hands.

"The foregoing list comprises most of the breeds which have been regarded as best adapted to the production of 'clear pork.' Other breeds, which form a greater proportion of lean property combined with fat, may be more profitable for particular situations. In cities and large towns a great quantity of pork is consumed in a fresh state. To be best adapted to this purpose, swine should be small-boned, only moderately fat, but plump and meaty, weighing, when dressed, from forty to a hundred pounds—the flesh fine-grained, and of the best quality as to flavor. Under this class, and as adapted to baconing, as before described, may be enumerated the following:—

"*The Neapolitan Breed.*—Martin, speaking of the excellence of Italian swine, observes: 'The ancient Romans made the art of breeding, rearing and fattening pigs, a study, and elevated, so to speak, various strains to the highest perfection. We cannot doubt that from those improved races of antiquity,

the present pigs of Italy have descended. It is not, we think, overstraining the mark, to regard the excellent breeds of pigs in Italy as the descendants of a long line of ancestry—of breeds established before Rome fell.' The Neapolitan is the most celebrated Italian breed, and has been the source from whence some of the most esteemed English breeds have been in part derived. They have also been introduced into the United States, but did not prove sufficiently hardy for ordinary management. Their flesh is of very superior quality. Martin's description of the breed is as follows: 'The Neapolitan pig is small, black, almost destitute of bristles, and remarkable for aptitude to fatten; it is short in the snout, small in the bone, with sharp erect ears; but it is by no means hardy, at least in our country, and if the sow happens to have litters in winter, it will be difficult, should the weather be severe, to save the young pigs from dying. But as a cross with some of our breeds, as the Berkshire, the Neapolitan race is most valuable. The cross-breed exhibits improvement in form without too great delicacy of constitution; they have a remarkable tendency to fatten, and though larger and stronger than the Neapolitan, display all their good qualities. The Essex breed is much indebted for its excellencies to the Neapolitan intermixture.'



IMPROVED ESSEX.

"This is one of the most valuable breeds now known. Its establishment is generally credited to the late Lord Western. It has, of later years, been extensively known in the hands of W. Fisher Hobbs, of Mark's Hall, Essex. It has, perhaps, carried more prizes at the shows of the Smithfield Club, within the last ten years, than any other breed. As above mentioned, it was derived from a cross with the Neapolitan, and inherits the color of that race,* with more size, finer symmetry, and much better constitution. Stephens, author of the 'Book of the Farm,' and the 'Farmer's Guide,' says: 'As to the breed which shows the greatest disposition to fatten, together with a due proportion of lean, I never saw one equal to that which was originated by Lord Western, in Essex. They were exceedingly gentle, indisposed to travel far, not very prolific, however, but could attain, if kept on, to a great weight, and so compact in form and small of bone and offal, that they invariably yielded a greater weight of pork than was judged of before being slaughtered. The offal was small, and more delicious ham was never cured, than they afforded.' Martin says: 'These animals fatten quickly, grow rapidly, and yield very superior meat. The hogs when fattened, will sometimes weigh twenty-six or twenty-eight stones, (fourteen pounds,) often eighteen or twenty,' equal to two hundred and fifty-two to three hundred and ninety-two pounds.

"Colonel Lewis G. Morris, of Fordham, Westchester County, New York, has made several importations of this breed, some specimens of which were purchased of W. Fisher Hobbs, and were of that gentleman's best stock.

"*Points of a Good Hog.*—The points which indicate the fattening tendency in a hog, are, the head small, with short snout and dished face; the ear small and thin; the neck short and thick; the chest broad and capacious;† the ribs round; the back straight; the loin broad; the rump long from hips

* Though the entire body of the "Improved Essex" is covered with a pigment of black, these swine dress handsome, showing as white and fair a skin as the Suffolk.—Com.

† The writer is aware that Liebig and some others have held that small chests were most favorable to the fattening tendency, but common observation does not support the idea.

backward; the legs straight and tolerably small; the skin soft and smooth, with thin, fine bristles.

"It should be borne in mind, however, that all these points do not indicate an animal best adapted to every situation. The thin skin and absence of bristles, though favorable to the accumulation of fat, when the animal is well sheltered and protected, do not denote the hardiness which may be necessary under exposure. If the animal is destined to support himself in a considerable degree, under the various transitions of weather, instead of the thin hide and scanty bristles of the *refined* varieties, he must be clad in covering which will afford the requisite protection against the elements, and the tendency to fatten must, to a certain extent, give way to a habit of activity and a tendency to muscular fibre. Even in ordinary farm management, there may be too much regard paid to the points which denote a tendency to fat only, to the neglect of those which denote constitution. A proper balance of these must be kept constantly in view, or the stock which will be found most profitable, cannot be bred."

EBEN WIGHT, *Chairman.*

POULTRY.

Remarks by Dr. Eben Wight, of the Norfolk Society.

Since public attention in this country has been specially drawn to the subject of poultry, citizens of the county of Norfolk have taken a conspicuous lead in the introduction and propagation of the most esteemed kinds. This was particularly evinced at the far-famed exhibitions of poultry held within a few years at the New England metropolis, where a large proportion of the best specimens in the different classes, hailed directly from this territory. The new interest in this branch of husbandry has been chiefly manifested in reference to varieties of the bird to which the term fowl is commonly applied. One variety of this bird, of oriental origin, has in fact been regarded with a degree of enthusiasm not inaptly characterized

as "the Shanghae fever," most of the importations of the stock having been derived from the city of Shanghae, in China. Individuals desirous of turning this excitement to their pecuniary advantage, have endeavored to make certain accidental or trifling differences in this variety, the basis for its division into distinct breeds. Hence we hear of Cochin-China, Imperial Chinese, Hong Kong, Hoang Ho, Brahma Pootra, &c., all derived from importations from Shanghae.

As showing the groundlessness of these attempted distinctions, attention is invited to some extracts from a work just issued in England, entitled "The Poultry Book: comprising the Characteristics, Management, Breeding, and Medical Treatment of Poultry; being the results of personal observation and practice of the best breeders, including Captain W. W. Hornby, R. N.; Edward Bond, Esq.; Thomas Sturgeon, Esq.; and Charles Punchard, Esq. By Rev. W. Wingfield, Honorary Secretary of the Cornwall Poultry Society, and G. W. Johnson, Esq., Honorary Secretary of the Winchester Society for the Improvement of Poultry."

The work commences with a chapter headed "History and Description of the Shanghae Fowl," as follows:—

"There is a doubt, which had better be removed from the very threshold, usually conveyed in the question—'Are Cochin-China and Shanghae fowls the same?' We have always entertained the opinion that they are; and as we have invariably found that fowls imported from China into this country, whether feathered-legged or plain-legged, whether dark-plumaged or light-plumaged, came hither, directly or indirectly, either from Shanghae or its vicinity, we have long since concluded that 'Cochin-China' is a name altogether misapplied to this variety. This conclusion amounts to conviction, since we have received a letter from Mr. Robert Fortune, who has passed so many years in various parts of China, in which he says: 'The man who first gave these fowls the name of Cochin-China has much to answer for. I firmly believe that what are called Cochin-Chinas and Shanghaes, are one and the same. One thing is certain,—the breed you have in this country as Cochin-China, are plentiful about Shanghae. They were discovered there after the war, and were frequently brought to this country, and

taken to India by captains of trading vessels. Was not this the date of their introduction into England? And what grounds has any one for supposing the fowls ever saw Cochin-China? We thought that this variety might have been earlier known, owing to our long-established commerce with Macao and Canton, but Mr. Fortune says that this breed is but little known in those warmer parts of China, and that in fact, the southern Chinese were as much struck with the size of the breed as we were.' He adds: 'The Shanghae breed seems to be more common about Shanghae, than anywhere else in the north, but I have found it over all the low country of that part of China. The southern breeds have been long well known to ship captains and English residents; but there is nothing very marked in their character.'

"We have already stated that we do not believe there are any grounds for the belief that this variety ever saw Cochin-China; and we think, with Mr. Fortune, (for his question is indicative as well as inquisitive,) that they were introduced into this country soon after the more northern parts of 'the Celestial Empire,' such as Shanghae, were thrown open to our traders, at the conclusion of the Chinese war, in 1843. At the poultry show held at the Zoölogical Gardens, in the May of 1845, there were prizes especially devoted to 'Malays and other Asiatic breeds;' but these brought to the exhibition no other oriental variety than the Malays. In fact, we never met with any published notice of the Shanghae fowls until 1846, and we shall be near the truth if we assign 1845 as the year they were first imported. It was in that year that Her Majesty received specimens of them which she exhibited at the Show of the Royal Dublin Agricultural Society, in the April of 1846."

The conclusion respecting the date of the introduction of the Queen's fowls, as expressed in the above paragraph, is erroneous. In the autumn of 1843, the London *Times* noticed them as being then in "Her Majesty's aviary at Windsor." It was stated that there were "seven Cochin-China fowls, five hens and two cocks imported direct from Asia." That they came from "Asia," there is no doubt, but the propriety of calling them "Cochin-China fowls," does not appear. The *Times*

goes on to describe the fowls, and makes a strange blunder by confounding them with the Fire-backed Pheasant of China.* The importation alluded to is worthy of note, as constituting the original leaven which has since leavened the whole lump of admirers of that kind of fowl in England and America.

Many readers will recollect that one of the distinctions which in this country has been claimed between the so-called Cochin-China and Shanghae fowls, was that the former were destitute of feathers on the legs, while the latter, were said to be feathered to the toes. But every one who has seen many fowls imported from Shanghae, knows that there can be no foundation for this claim, as both feathered and unfeathered legs are often found in the fowls obtained at that place. The name of Cochin-China has, however, been given to fowls in some instances, without even the pretence of this distinction to justify it. One of the first importations of the Shanghaes to this country,—that of Dr. Baylies, of Taunton,—were called Cochin-Chinas by a notorious person who subsequently obtained the stock, although he was expressly told by Dr. Baylies that the fowls came from Shanghae!

We recur again to the work before us:—

"Having thus traced out the date of the introduction and the place whence derived, let us next inquire something of the characteristics and treatment of the birds as they occur at Shanghae itself; and here Mr. Fortune again comes to our aid. In the letter already quoted, he says: 'The Shanghae breed occurs both with feathered and unfeathered legs, but more frequently unfeathered. The most admired kinds there, are the game [i. e., partridge or pheasant] colored ones. Many of them are [colored] much like the pheasant of the country. However, I am safe in saying that the Chinese do not attach so much importance as we do to purity of color; large size and large eggs are what they most admire and prize.'

"It being certain that the true Shanghae fowl is met within its native district with plain legs, even more frequently than with legs feathered, or *booted*, as it is technically termed, the point often disputed is now settled, as to whether this is any

* See Albany Cultivator for 1844, p. 43.

demonstration of a distinct breed. Henceforth it must be held to be a mere matter of taste.

"Mr. Fortune's testimony settles another disputed point. It is very evident that, except as a matter of taste, the light colored should have no preëminence over the darker plumaged; and those societies have acted judiciously which have given separate prizes of equal value to all the subvarieties of color. It is judicious, because it is needlessly placing a judge in a very perplexing position to call upon him to decide upon specimens of equal merit in all important points, but differing in color."

The work then speaks of the black, white, gray, (or so-called "Brahma Pootra,") buff, cinnamon, and partridge or grouse-colored Shanghaes as subvarieties of one breed. In regard to the "Brahma Pootras," specimens of which, introduced from this country, are known to the authors,—their "history" is summed up by an expression of the opinion "that it will not prove a distinct breed, but either a variety of the Shanghae family, or the result of a cross between those birds and the Malay." This is just what they are *known* to be in this country. Some of them came from Shanghae, and some are a cross of these and the "Chittagong," a term which, as used by English authors on poultry, is only a synonym of Malay. Hence they were at first, and still are in many places, merely called "Chittagongs."

In reference to names of fowls, there is another matter which it is well to notice in this connection. In the United States, the term Hamburg is often applied to fowls with crests or top-knots. Late English writers do not use the term. According to the classification adopted by the work above noticed, and which prevails with the British poultry societies, all top-knots are placed under the head of Poland fowls, and are subdivided according to coloring and certain minor distinctions —as White Polands; Black Polands with white tops; Silver Polands, (those having a silvery-white ground color;) Golden Polands, (having a yellow ground color,) with other classes for such as have beards and muffs.

Hamburg fowls, on the other hand, have no top-knots. Under this head are placed, what in this country are called

Bolton Grays, Creoles, &c. The Hamburgs are divided into Silver-spangled Hamburgs and Gold-spangled Hamburgs, and these two classes are again subdivided into Silver-pencilled Hamburgs, Golden-pencilled Hamburgs, &c. To avoid confusion, it is proper that our amateurs should conform to this classification.

The foregoing remarks in reference to the misnomers of fowls, it is hoped, may tend to correct the misunderstanding which has prevailed on the subject in this vicinity. Other matters in reference to poultry have lately been so thoroughly discussed through the medium of periodicals, poultry books, &c., as to require no further notice at this time.

ESSEX.

From the Report of the Committee.

By far the largest portion of the exhibition was composed of Chittagong, Shanghae, and other large breeds of fowls, which we are well aware sometimes command enormous prices from dealers and amateurs. We are of opinion, however, that their real value to the farmer is very much overestimated; their superiority in size being counterbalanced by their inferiority as layers, and the coarseness of their flesh. Dorking, Black Spanish, or some similar breed, will, we think, be found of more advantage to all persons who rear them for their legitimate end.

A. L. Pierson, *Chairman.*

MIDDLESEX.

Statement of James A. Barrett.

These fowls I offer as a specimen of a flock of about ninety, which I kept through the last winter, and the most of the spring. Since then I have reduced them so that at the present time I have about thirty-five old hens on hand. Since the first of last January, they have laid six hundred dozen of eggs. And I have raised about one hundred chickens. I have kept them mostly

on damaged corn, wheat screenings, and such cheap grain. The rooster has weighed about eleven pounds, and the hens from seven to eight. The receipts, including the eggs laid, fowls sold, and chickens on hand, (after making up the number of ninety with which I began the year,) &c., amount to $155.23. Cost of keeping and other expenses, $83.30. Net gain, $71.93, which is about eighty-six and one-third per cent. on the expense.

The chickens which I offer for premium were most of them raised from fowls that were two years old. I have found that the chickens are much stronger and less likely to droop and die, when raised from old fowls than when raised from young ones. I have raised about one hundred chickens, and kept them mostly, except when small, on cheap grain. This rooster weighs about six and three-quarters pounds; the pullets five pounds. The cost of keeping, $14.77. The fowls sold, and those on hand, $61.57. Net gain, $46.80.

CONCORD, October 4, 1853.

Statement of Joseph Hosmer, Jr.

These fowls that I present are a mixture of Shanghae and Cochin with the gray Dorking and native. They were hatched about the first of April, having set three hens on the 7th, 8th, and 10th days of March; they came off as above, with thirty-two chickens, of which I raised thirty-one. Thirteen pairs I sold, fourth of July, for $1.25 per pair, $16.25.

I regard the change of the rooster, every year, as indispensable to the raising of healthy fowls, and there will be no trouble with proper keeping in raising chickens and having good laying hens from any breed.

CONCORD, October 4, 1853.

FRANKLIN.

Statement of William A. Howland.

I commenced the present year with fifty hens and four cocks, the same number as last year. As the committee last year reported that they thought my hens were too large to be as

profitable as smaller ones, I have this year, by way of experiment, procured several smaller kinds. I now present you with eight distinct varieties, viz.: White Shanghaes, Dorkings, Black Spanish, Poland, Plymouth Rock, Bolton Grays, Bantams, and last, but not least, a cross between different breeds, of a good size.

I am satisfied that my largest kinds are the most profitable. They not only lay younger, but larger eggs and more in number. When dressed, their flesh is yellow, rich, and good flavored; and for the table, they are not surpassed by any thing that wears feathers. The fifty hens have laid 4,569 eggs since the 1st of last January, and raised 110 chickens. As it is difficult, among so many, to know how many each hen lays, I have selected but two, one of which has laid 176 eggs within a year, hatched and reared one brood of chickens. The other, a white Shanghae, has laid 131 eggs and raised one brood of chickens since January 1st. I sell my eggs at an average of about fifteen cents per dozen. Some choice ones at one dollar per dozen. Last year I sold my chickens, for market, at from ten to twelve and a half cents per pound; average weight, about four pounds; some selected ones, at one dollar each, when alive.

I keep the largest part of my fowls in a yard, with a good shelter, and a supply of food and water. I feed them with corn meal mixed with water, corn, oats, boiled potatoes, meat, burnt bones and grass, in summer, and rowen hay in the winter. When they are confined from insects, they should have a supply of meat as often as once a week. The cost of keeping, this year, I should judge has been about two mills per day, each.

CONWAY, 1853.

BERKSHIRE.

From the Report of the Committee.

The committee to whom was confided the important duty of making the proper comparative estimate of the various species of poultry on exhibition, respectfully report, that the number, variety, and excellence of the several lots of poultry offered

for examination, in a very great degree, exceed those of former years.

Some of the varieties imported within a few years past appear to have received an unusual degree of attention from citizens in various parts of the county. The species of larger fowls that have been presented for examination were very much admired as well by the committee as by the citizens in attendance. The stately Shanghae, the graceful Dorking, the fair proportion of the Chittagong, all showed that foreign fowls as well as foreign fashions, have been received and cultivated with a very considerable degree of extended popular favor.

J. C. Wolcott, *Chairman.*

NORFOLK.

From the Report of the Committee.

There were no natives, if we except some geese and turkeys. This should not be. The conditions upon which premiums are offered should positively require statements showing the expenses and income for at least twelve months previous to their being offered. Then the number of premiums should be reduced at least one-half. At the same time the amount should be no less than now offered. The premiums should be offered for the most profitable fowls without regard to breeds. We have had experience to show that poultry and eggs can be pro duced at a handsome profit; no part of the State can be more favorable for this business than Norfolk County. We have numerous breeds of fowls from which a good selection might be made; then grain may be raised as cheap as in other counties, and the market is as convenient as we could desire. As population increases, so the price of eggs and poultry increases. Our towns are fast filling up with inhabitants. It is desirable that this branch of business should keep pace with the population, as it will affect both producer and consumer favorably.

R. Mansfield, *Chairman.*

BEES AND HONEY.

HAMPSHIRE.

Report of the Committee.

The exhibition of honey, this year, indicates that more interest is felt in this subject than formerly. The productions of the honey bee are beginning to be appreciated, both as a source of pleasure and of profit. To make bees profitable, the keeper must study their habits and consult their tastes. The times have changed since a swarm of bees found a home in the carcass of a lion. In our day, neatness and order are essential to the prosperity of bees. The hives should be well ventilated. For the purposes of ventilation, ease of management, and convenient removal of honey at the pleasure of the keeper, the hive patented by Phelps, of Ohio, and exhibited at the Fair, this year, is one of the best ever invented. The best book on bees is that of Mr. Langstroth, of Greenfield, whose apiary is worthy of admiration and examination.

DAVID S. COWLES, *Chairman.*

FRANKLIN.

Report of the Committee.

Your committee on bees and honey feel gratified in having assigned to them for consideration the very *sweetest* of your departmental subjects. All that is wanting to do justice to this matter is a "honeyed tongue," and a pen dipped in the "Balm of a Thousand Flowers."

From time immemorial the bee has attracted the attention of man. Its nectar sweetened the verse of the earliest poets, while it tickled their palates, so that the insect may be fairly said to occupy a niche in the classical pantheon. The pages of Holy Writ, also, contain allusions, very fine and very apt, to the habits and disposition of the bee. Says David, when speaking of his foes: "They compassed me about like bees;" a striking simile of a chieftain in the hum of battle, singled out

and beset on all sides by furious foes. "They chased you as bees do," said Moses to his charge, "on this side of Jordan," when speaking of the Amorites, and the general diabolism of the children of Israel. And Moses used the very best similitude possible; for what will give more effectual chase than a posse of enraged bees? It is verily true that,

> He who'll face the vollied round,
> They'll put to flight.

For ages, too, has the bee attracted the attention of man, for the purpose of domestication and profit. Various have been the methods pursued, and multiform the contrivances for hiving and sheltering these insects, from the primitive sections of hollow trees down to the *ne plus ultra* bee-home of Langstroth. This gentleman, who, like many other scientific men, of both hemispheres, has made the bee the subject of careful study and observance for a series of years, has given of late to the world the book of his experience, and the hive of corresponding fitness; both of which will be hailed with delight by the apiarian and all searchers into nature's arcana, generally. His hive, under proper management, renders a swarm of bees literally a "thing to play with," as was once remarked to us by a bee-master who was showing off his aptness about an old fashioned hive, but who, unfortunately, was the next instant horribly stung by one of his playthings, which very *pointedly* enforced a mind-your-own-business lesson, and left the meddler to his own pungent and *stinging* reflections.

The "untutored Indian" knows the bee as the precursor of civilization—the forerunner of the white man. When, in his natural solitude, the red man sees the little winged honey-seeker journeying upon his prairies from flower to flower, and hears its industrious hum amidst the arches of his forest depths, he says with a sigh: The white man will soon be here with his plough and axe; this prairie will be under the dominion of the one implement; this forest will fall before the other; hunting is done, the white man is coming!

Small and insignificant as our subject may appear to the unobserving, it is, to the close observer of nature, to the profound thinker, to the philosopher, a theme of import and conse-

quence. Inferior creations may teach man, the chief work of God on earth, many useful lessons, and give to him hints for profitable adductions. Does a geometrician wish for a cellular plan giving the most space with the least waste of room and constructing material, let him examine a simple honey-comb. Does he wish to alter his governmental constitution, let him think of the success attendant upon the unchanging law of the hive. Does a man lack order and system in the management of his affairs, let him buy Langstroth's book and see the systematic instinct of the bee. Is he wanting in industry and energetic action, let him look at a bee-hive. Has he that awful human failing, minding of business other than his own, let him look in the same direction and be instructed.

The culture of bees is easy, and may be made profitable. There is honey around the homes in Franklin, sprinkled upon her hills and vales, forests and flowers, and only accessible to this wondrous insect. Honey is also plentiful within these homes, just as sweet, and appreciated by the tasteful; but we want both kinds. Again, the apiary forms one of the most pleasant features of rural life. Many a country-bred dweller in the pent-up city can look back with a tear of pleasure to the door-yard of his native cottage; the verdant turf, the pleasant voices of playing children, the carroling birds, the hums of the bee-hives, and the eager excitement attendant upon the "swarming" on some balm-breathing day of June.

In view of all these things, and without further lengthening of their report, your committee respectfully tender to their brother apiarians and fellow-coadjutors of this association the following little swarm of B's, which, if properly *hived*, may work profit for their keeper:—

Be honest, Be useful, Be steady;
Beware of Bad Beings and things;
Be ever By industry ready,—
Bread, Beef, Bees, and Bounty it Brings.

Your committee cheerfully recommend the highest gratuity—one dollar—to Mr. Langstroth, upon the hive exhibited to them; and only regret that they are limited in their award.

Josiah D. Canning, *Chairman.*

Statement of Asahel Wright.

Statement of the profit of bees kept by Asahel Wright, of Deerfield, one of the committee.

I commenced with three swarms, April, 1844.

	Dr.	
April 9, 1844, to three swarms bees, . .	$21 00	
For boxes, hives, and all other expenses, .	39 04	
		$60 04
	Cr.	
Sold from the above three swarms, . .	$102 05	
To nine stocks on hand, ...	36 00	
		138 05
		$78 01

THE DAIRY.

ESSEX.

From the Report of the Committee.

There were eight entries of butter submitted to their inspection. One failed in quantity, to comply with the society's regulations. To the remaining seven parcels, the committee gave the most patient inspection, and applied all the various tests at their command.

There were two parcels of cheese entered, which in the opinion of the committee were not of that "decidedly superior quality," which the rules of the society require to entitle either parcel to a premium. The committee would suggest the inquiry, whether the interest of an improved and progressive agriculture like that of Essex County, is to be further advanced by the present system of premiums for the dairy. Encircled as is our county by a number of prosperous cities, and filling up, as are all our towns, with a busy and thriving population, denser than any other of equal extent in the United States—can we, by any premiums which this society may offer, induce

our farmers, with the present and rapidly increasing demand for milk, to go extensively into the production of butter and cheese? Your committee think not; and that the time has come for a revision of your dairy premiums.

For the Committee,

RICHARD P. WATERS, *Chairman.*

Statement of Jonathan Berry.

I present for your inspection a box of butter containing sixteen pounds, being a sample of 620 pounds and 435 quarts of milk, equal to fifty pounds of butter, making 670 pounds of butter made from seven cows, between the 20th May, and 25th of September. The cows have been kept upon a common pasture, with corn fodder daily, and bone-dust once a week, the latter part of the season.

Process of Making.—The milk is strained into tin pans and set in a cool cellar, where it remains from thirty-six to forty-eight hours, according to the weather, care being taken to take off the cream while the milk is sweet. The cream is put into a vault made in the bottom of the cellar for that purpose. We churn once a week. After it is churned the buttermilk is thoroughly worked out, the butter is salted with about one ounce of salt to the pound, and the next day weighed out for market.

MIDDLETON, September 27, 1853.

Statement of Charles P. Preston.

I present for examination, a pot of June, and also a box of September butter, samples of eight hundred and twenty-eight pounds made during the four months next following May 20th, of the present year, the dairy averaging nine cows.

The milk is strained into tin pans and placed in the cellar where it remains from thirty-six to forty-eight hours, when it is skimmed, and the cream placed in a vault, made for the purpose, until churning, which is done once a week.

The butter is worked by hand until the buttermilk is com-

pletely worked out, and salted with from three-fourths to one ounce of salt to the pound.

The cows have common pasture till August 10th, when they are fed by an addition of corn fodder.

North Danvers, September 27, 1853.

MIDDLESEX.

Statement of Elijah M. Read.

I present for your inspection one box of new churned butter, made from the milk of my Alderney cow. The cream was gathered from the 21st to the 30th of September.

Process of Making.—The milk is strained into tin pans, about one-half of which is set over a kettle of hot water and brought up to about one hundred and twenty degrees of heat by the thermometer;—it is all set in a cool place and allowed to stand from thirty-six to forty-eight hours, when the cream is taken off and put into a tin pail and stirred daily. After it was churned, the buttermilk was worked out by hand, and salted to the taste. After standing thirty-six hours, it was worked over the second time.

Tewksbury, October 4, 1853.

Statement of John F. Rice.

The process of making this butter, varies but little from what I have stated to the committee on former occasions.

The milk was strained into tin pans, standing in an upper room for about thirty-six hours; the cream was then taken from the milk and put into tin pails and placed near by, or on ice, to preserve the right temperature. The cream is from four days' milk of a dairy of ten cows, that have had no extra feed whatever.

This butter was churned in one of Parker & White's crank churns, until well come, then rinsed in cold water, taken from the churn and salted, one ounce to the pound.

After remaining about twelve hours, it was worked into pound lumps and prepared in the manner here presented.

Marlborough, October 4, 1853.

Statement of William F. Barnard.

The lot of butter which I offer for your inspection, is from one week's cream of a dairy of seven cows, and was made in the following manner. The milk was strained into tin pans and set on shelves in the milk-room, properly ventilated by a window which is kept open most of the time, screened by a blind on the outside; after standing from thirty-six to forty-eight hours, according to the temperature of the weather, the cream is then taken off and put into tin pails and kept in the same room till churned. The buttermilk is then drawn off, the butter taken out and worked over, and salted in proportion of about one ounce to the pound. I never use water in rinsing the butter, or ice in the cream. After remaining about twelve hours, the butter is again worked over and weighed into pound lumps, and prepared for the box by the use of the hand and thin pieces of hard wood, such as are used by dairy women in shaping the lumps.

Marlborough, October 4, 1853.

Statement of Daniel L. Giles.

The box of new churned butter which I present for your inspection, is a specimen of six hundred and forty pounds, made since the 9th of June last from a dairy of eight cows.

The average quantity per week, was forty pounds.

The cows have had common pasture until the middle of August, since then, fed with corn fodder.

Process of Making.—The milk is strained into tin pans, and stands in a cool chamber from thirty-six to forty-eight hours, when the cream is taken off and put into a large cooler, and stirred daily, until churned.

We churn twice and three times a week. After churning, the buttermilk is thoroughly worked out with the hands, and the butter salted to the taste. After standing twelve hours, it is again worked and weighed, each pound separately.

Lincoln, October 3, 1853.

HAMPSHIRE.

Report of the Committee.

Butter.—The display of butter at the last Hampshire Agricultural Fair was the finest ever seen in the Connecticut Valley. There were thirty-eight entries, making an aggregate of four hundred and ten pounds. The committee were fully convinced, immediately after commencing their labor, of the difficult duty they had to perform, viz.: to select eight parcels, deemed the best, for which the society had offered as many different premiums, the highest being four dollars, and the lowest fifty cents. The committee spent nearly half a day in tasting and re-tasting, comparing and re-comparing, in order to do justice, according to their best judgment, to all the competitors who had complied with the rules of the society. Where all was so nice, it was no easy matter to do justice to all, with the limited number of premiums to be awarded.

Instead of publishing the statements furnished by the competitors and exhibitors, the chairman of the committee decided that it would be more acceptable to butter-makers and members of the society generally, to have some facts and suggestions presented—such as experience and observation have developed and recorded.

First, then, as to cows. The different breeders and dealers in stock are far from being agreed as to which variety of all is the best. Some prefer the Durham cow, others the Yorkshire, the Devon, the Ayrshire, the Staffordshire, the Kerry, of Ireland, and the Alderney. The latter is universally admitted to produce the richest milk in quality. The Alderneys, or improved Gurnseys, have been known to give twenty-six quarts of milk apiece, per day; the cream of which has produced fourteen pounds of butter per week.

A full bred Durham has been known to produce twenty-eight quarts a day, and eighteen pounds and six ounces of butter per week. A test was made at Liverpool, a few years since, of the qualities of milk, with the following results:—

Yorkshire and common cows, eight per cent. of cream;

Ayrshire, fifteen per cent.; Alderney, twenty-three and one-half per cent.

There are some who prefer the native cow, because more easily kept. Much depends, however, upon the treatment of the animal. If the keeping be poor, the less one has to do with fancy stock, the better. If it be good, then will native stock soon become fancy, or highly improved stock. Much might be said on this subject, but the want of space forbids further remark.

Secondly. With regard to keeping, or the effect which pasturage has upon the quality of butter. It is a common remark that certain localities produce better butter than others. Much less, however it is thought, depends upon pasturage than upon the dairy-maid. In every district, says Dr. Anderson, an English agricultural writer, where good butter is made, it is universally attributed to the richness of the pastures, though it is a well-known fact, that, take a skilful dairy-maid, from that district into another, where no good butter is made, and where, of course, the pastures are deemed very unfavorable, she will make good butter, as good as she used to do; and bring one from the last district into the other, and she will find that she cannot make better butter there than she did before, unless she takes lessons from the servants or others whom she finds there. I have frequently, says he, known instances of this kind.

M. Tessier of the French National Institute, remarks, that the particular quality of Bretagne butter, whose color, flavor, and consistence are so much prized, depends neither on the pasture nor the particular variety of cow, but on the mode of making. This butter is of a superior quality, because they make it of the richest cream, and in large quantities at a time. As soon as it is made and washed, they sprinkle it with sweet milk, spread it out in flatted cakes, larger or smaller, but rarely containing less than six pounds, and lay it on a kind of pan placed on hot cinders, and covered with a copper lid, on which are put cinders, also. It remains there some minutes, more or less, according to the bulk of the cakes. This mode requires skill and practice, in order to succeed.

Thirdly. With regard to the care and treatment of cows.

They should be kept clean—washed, if need be, and curried. The following statement is copied from one in Ireland, who stated that he had an actual profit of £331 6s., on keeping a single cow, *in house*, eight years—during which time she yielded 38,855 quarts of milk. In the summer he fed his cow on clover, rye-grass, lucerne, and carrots, four times a day, feeding at noon about four gallons of grains and two of bran, mixed—giving her no more than she would eat up cleanly. The feed in the winter was the same; feeding five or six times a day; supplied her with food while milking; keeping the manger clean; never tied her; being particularly careful to milk her cleanly—milch cows being often spoiled for want of patience in the milker. This neglect frequently causes suppuration and blindness in the teats—the want of milk. The result of one year, the cow then being eleven years old, is here detailed: She calved on the 3d of April, and on the 5th of June, the calves—twins—being nine weeks old, were sold for £12 12s. From the 6th of June to the 3d of July, four weeks, she gave twenty-four quarts, daily, equal to six hundred and seventy-two quarts, yielding seventeen pounds of butter per week, or sixty-eight pounds per month. From the 4th of July, to the 18th of September, eleven weeks, she gave twenty-two quarts, daily, equal to sixteen hundred and ninety-four quarts, yielding sixteen pounds of butter per week, or one hundred and seventy-six pounds for the whole time. From the 19th of September to the 13th of November, eight weeks, she gave eighteen quarts, daily, equal to one thousand and eight quarts, yielding fourteen pounds of butter per week, equal to one hundred and twelve pounds, &c. Total, forty-eight weeks, averaging about fourteen quarts per day, equalling five thousand three hundred and sixty quarts, yielding five hundred and ninety-four pounds of butter. This, at twenty cents a pound, would equal one hundred and eighteen dollars, eighty cents. The rent of a cow, per year, in Ireland and Scotland varies from seven to twelve pounds sterling.

Lastly. The dairy-room. This should be of equable temperature, say about forty-five degrees—with a northern exposure—well ventilated—no inside communication with any other building—free from smoke—and perfectly clean. So of every

utensil used. Cast-iron pans, tinned on the inside, are the best coolers; these, and the pails, &c., should all be exposed daily to the sun. Milk but twice a day, and be sure that you strip perfectly clean. Allow no harsh, rough, cross-grained milker to approach your cows any sooner than you would a slut or snuff-taker to enter the dairy room. With regard to churning, the cream should be of the temperature of about fifty-three degrees. This is declared to be the very best temperature for churning, if you would make butter of the finest quality. If you desire to obtain the greatest quantity, churn at fifty-six degrees. When the churning is done, place the butter in pure cold spring water, with some salt in it, preparatory to freeing it from every particle of milk. Butter should be salted at the rate of about one pound of the finest and purest salt that can be obtained to every fourteen pounds of butter.

The process of obtaining the cream to an extent hitherto unattainable, has been effected by Mr. Carter, an Englishman, who details his experiment, in a paper presented to the Society of Arts, as follows:—

"A peculiar process of extracting cream from milk, by which a superior richness is produced in the cream, has long been known and practised in Devonshire; this produce of the dairies of that county being well known to every one, by the name of 'clotted' or 'clouted cream.' As there is no peculiarity in the milk from which this fluid is extracted, it has been frequently a matter of surprise that the process has not been adopted in other places of the kingdom. A four-sided vessel is formed of zinc plates, twelve inches long, eight inches wide, and six inches deep, with a false bottom at one-half of the depth. The only communication with the lower compartment is by the lip, through which it may be filled or emptied. Having first placed at the bottom of the upper compartment a plate of perforated zinc, the area of which is equal to that of the false bottom, a gallon (or any given quantity) of milk is poured (immediately when drawn from the cow) into it, and must remain there at rest for twelve hours; an equal quantity of boiling water must then be poured into the lower compartment through the lip; it is then permitted to stand twelve hours more, (i. e. twenty-four hours altogether,) when the cream will be found perfect, and

of such consistence that the whole may be lifted off with the finger and thumb. It is, however, more effectually removed by gently raising the plate of perforated zinc from the bottom, by the ringed handles, by which means the whole of the cream is lifted off in a sheet, without remixing any part with the milk below. With this apparatus I have instituted a series of experiments, and as a mean of twelve successive ones, I obtained the following results: four gallons of milk, treated as above, produced, in twenty-four hours, four and one-half pints of clotted cream, which, after churning only fifteen minutes, gave forty ounces of butter; four gallons of milk, treated in the common mode in earthen-ware pans, and standing forty-eight hours, produced four pints of cream, which, after churning nineteen minutes, gave thirty-six ounces of butter. The increase in the quantity of cream, therefore, is twelve and one-half per cent., and of butter upwards of eleven per cent. The experimental farmer will instantly perceive the advantages accruing from its adoption, and probably his attention to the subject may produce greater results. I shall feel richly rewarded if, by exciting an interest on the subject, I can produce any, the slightest improvement, in the quality or mode of producing an article which may properly be deemed one of the necessaries of life."

L. WETHERELL, *Chairman.*

Report of the Committee on Cheese.

That your committee might be better qualified to discharge the duty assigned them, they were led to a brief examination of the article of cheese.

1. Etymologically. They found the occurrence of the word "cheese," in at least eleven different languages. They found, moreover, that the primary signification of the term is to curdle or congeal, from collecting, drawing, or driving. Cheese, therefore, is the more thick or coagulable part of milk, called curd, separated from the more thin or watery part, called whey, by a process of which the sequel will speak, and pressed into a hoop or mould.

2. We looked into the subject, historically. And we found that cheese is "nothing new under the sun;" that it has a his-

tory, and a history, too, that carries us back to the days when the world was young. David, the son of Jesse, carried ten cheeses to the captain of his brethren, when he, a mere stripling, went out, single-handed, to fight the great Philistine, and lay his pride in the dust. More than three thousand years ago, Job said: "Hast thou not poured me out like milk, and curdled me like cheese?"—indicating, thus, his knowledge of the article as then existing. Frequent mention is also made of it in old Latin authors. In coming to their work, your committee felt, therefore, that they had to do with that which is venerable indeed, having descended to us from generations far away and buried, and through the lapse of centuries long gone, and they tried to feel something of the reverence that became them in the presence of the survivor of so many buried generations and centuries.

3. We made inquiry into the chemistry of cheese. In answer to our inquiries, our most worthy friend, "The Progressive Farmer," gave us all needed information, as he has done on most other matters connected with "practical agriculture." We learned from him that about four per cent. of milk is sugar; that if the milk be kept for some time in a warm place, its coagulable part acts upon the sugar, and changes some portion of it into what is termed lactic acid, and that the soda, which is one of the substances contained in milk, and whose office it is to hold the curd in solution, is acted upon by the acid above mentioned, so that its alkaline power is neutralized, whereupon the curd immediately appears in the form of curdled milk, which, when pressed, forms a kind of cheese. As this process of cheese-making would, however, be slow and inconvenient, and, withal, would not secure cheese of a good quality, it is common to make use of some other acid than that generated in the milk, in order to neutralize the soda, and destroy its power. For this purpose, an animal acid is used, called rennet. This is taken from the stomach of the sucking calf, where its office is the same as that to which the cheese-maker puts it, viz., to curdle the milk taken from the cow. The milk thus curdled is more digestible. For any further information, we refer to our friend, the "Farmer," of whom, we trust, all other

farmers and farmers' wives will be constant and diligent learners.

4. We proceeded to our work, experimentally. While engaged in this part of our examination, we could but recall the old proverb, so often quoted, "*de gustibus non disputandum est*," which is, being interpreted, "there is no accounting for the tastes."

GEORGE E. FISHER, *Chairman.*

HAMPDEN.

From the Report of the Committee on Butter.

Your committee would say of the butter offered, that it was very good, yet much of it lacked that firmness and dryness essential to excellence. In view of the vast importance of the article, and of the great proportion of second and third quality that often comes to our markets, they wish to add a few words in favor of great care in the management of dairies. Too much can hardly be said in favor of extreme carefulness; the good dairy-woman should no more suffer milk or cream to be slopped about her dairy-room, than upon her best carpet. The dairy-room should be well ventilated, the atmosphere cool, dry, and free from the taint of any sour or decomposing substance. To attain perfection in the article of butter, there must be a good selection of the stock, which should be fed in rather dry and sweet pastures, great care and thorough cleanliness in the management; the cream to be churned as often as twice a week in warm weather, the buttermilk thoroughly worked out without so much handling as to make the butter soft and greasy, for it should have the firmness and dryness of wax, rather than the consistency of lard; the salt used for seasoning should be of the best quality and thoroughly incorporated. Butter made as above described will keep sweet for years, and always command a ready sale and good price, while much that comes to our markets will be unfit for table use in a week.

R. E. BEMIS, *Chairman.*

From the Report of the Committee on Cheese.

The committee on cheese report that there were but two entries of cheese, both of which were worthy of high praise. The manufacture of cheese is not a prominent article among the dairy products of Hampden; the rapidly increasing demand for the milk and butter, for the supply of our home market at more remunerating prices, has manifestly reduced the aggregate of cheese from former years; the samples on exhibition gave satisfactory evidence that the *modus operandi* of making an article every way worthy of the premiums offered by the society, had not been laid upon the shelf; it may be considered a question of some importance whether the great number of premiums offered upon butter and cheese has the effect desired and aimed at by the society. No one, offering a good article of either, would sacrifice their credit, as the manufacturer, or willingly consent to be placed in the sixth degree of excellence. It is not our duty to suggest a better way; we only commend the subject for consideration.

H. E. Mosely, *Chairman.*

FRANKLIN.

From the Report of the Committee on Butter.

Butter, from long and common use may justly be considered one of the necessaries of life; and any improvement in its richness or purity, adds to the health and comfort of our great family.

Twenty specimens of the article have been submitted to your committee for inspection, most of which bear evidence of commendable skill and taste in manufacture.

In deciding upon the relative claims of the various competitors for the society's premiums, your committee have felt a degree of diffidence in making the selections, on account of the equality of many of the samples. Then, in deciding upon the qualities of such an article that one calls prime, another might, with as much propriety, call second, so our decision must necessarily be somewhat arbitrary.

Statement of Mrs. Rosanna Martindale.

Set the milk in tin pans, let it stand till sour, then remove the cream and place it in a refrigerator till ready to churn, then add the juice of three or four carrots; after churning, work well three times.

Statement of Mrs. A. DeWolf.

In warm weather the milk stands about twenty-four hours; in cool weather from thirty-six to forty-eight hours. In warm weather churn once in a week; in cool weather once in two weeks. The cream is kept in a cool place in tin. In warm weather it is hung in the well the night previous to churning. All the milk is taken out, the butter is then weighed, and one ounce of salt added to each pound of butter. It is then set in a cool place till the next day, when it is again worked and returned to a cool place and excluded from the air, when it is fit for use.

Statement of Mrs. George C. Dole.

The milk is strained into pans and set in an airy place, not allowing it to stand more than thirty-six hours before removing the cream; it is salted, and stirred frequently, as new is added, for about four or five days. It is then churned, the butter separated from the milk and salted; after standing a few hours it is put into a machine and worked till free from buttermilk.

Statement of Mrs. Moses A. Barnard.

The milk is set in a cool place in tin; stands from thirty-six to forty-eight hours; then the cream is taken off and kept in a tin vessel; churn twice a week; the butter is separated with care from the milk; it is then salted so as to be palatable. The cows are kept in a common pasture with no extra feed.

The owners of the other samples are entitled to the thanks of the society for the spirit of emulation in the production of so desirable an article as good butter, as is manifested by them in the various specimens exhibited.

EDWARD BARTON, *Chairman.*

NORFOLK.

Statement of John H. Robinson.

Herewith I send a statement of the yield of milk from six of my cows, from the year beginning September 20th, 1852, ending September 20th, 1853.

I have selected from my stock such as I intended to keep the entire year; not, however, so much with reference to their milking properties at any given time within the year, as with the view of ascertaining precisely the average yield per day, through the year, of what may be considered good fair milkers.

Two of them calved in September, 1852; two in December, and two in January, 1853: so that it will be seen that four of them have been in milk only for eight or nine months in the year.

The whole yield has been 16,653 gallons, making an average for each cow per day, of seven quarts, one pint and one gill. The greatest average of any one of the six has been nine quarts and one pint per day; and the smallest average five quarts and one pint; all measured by the beer measure, about the twentieth day of each month, and a memorandum made by myself of the product of each cow, separately. The milk was delivered for the Boston market at an average price of fourteen cents per gallon, at the barn, which would amount to $582.82, or $97.13 for each cow.

The feed has been, in the winter, the best of English and salt hay, (half of each) with half a bushel of brewer's grains per day a part of the time, or instead of grains, half a peck of corn and oil meal soaked in water, twelve hours before feeding. In the summer and fall, no grain, but good pasturage, with a plenty of green corn fodder. They have received no better attention than the balance of my stock, all having been fed with the same quantity and in the same way.

My rule is, when feeding from the barn, to have them fed and milked about the same time each day: say hay three times, grain twice, and water three times, the last watering at eight o'clock in the evening, which I consider very important. In

winter my milch cows are kept for the most of the time in the barn—often, in very cold weather, for two weeks together.

The cost of keeping, at the present high price of hay and grain, may, I think, be put down at about $2.25 per week, from November to June, and the rest of the year at fifty cents; making the whole cost for the year about $75 per head.

As such a difference of opinion prevails as to the average yield of milk from a stock of cows, I have ventured to present somewhat at length the particulars herewith submitted, and if in the opinion of the committee they are considered of any importance, they may be disposed of in such way as is judged best.

DORCHESTER, September 21, 1853.

FRUITS AND VEGETABLES.

ESSEX.

Report of the Committee.

In the exhibition of to-day we were reminded of the great advance which has been made in this useful department, since the show in South Danvers in 1835 or '36, where one of your committee exhibited native pears from Maine. This was about the commencement of a regular systematic arrangement of fruits at our annual shows. The exhibition at this time, notwithstanding the rain of Tuesday, and the short crop of apples in our county, was much better than we could have anticipated. Pears, grapes, and peaches, were, as usual, good. As regards the last named fruit, it is remarkable that the crop of early peaches exceeded that of the apple, a circumstance which will not probably occur again for years at least. There were sixty-five entries of fruit, from the following places, viz.: Lawrence, thirteen; Andover, nine; Haverhill, nine; Methuen, fourteen; Salem, five; Newburyport, three; Newbury, three; Wenham, two; Groveland, Georgetown, Beverly, Marblehead, Middleton,

Topsfield, Boxford, and Amesbury, one each. Charles F. Putnam, of Salem, had one hundred and fifty distinct varieties of apples and pears; Robert Manning, one hundred and twenty-one of pears; Moses Pettingill, of Topsfield, fifty-four of apples, pears, and peaches; Ephraim Emerton, of Salem, twenty-nine of pears; A. D. Rodgers, twenty-five of grapes and pears. There were fine Black Hamburg and White Sweet Water grapes, open air culture, from S. H. Elliot, of Lawrence. Of the native grapes shown, your committee found none superior to those of last year. Fine Angouleme Pears from David Nevins, of Methuen, and Rev. Dr. Packard, of Lawrence. Superior "Bezi de la Motte" pears from Dr. Robinson, of West Newbury, one cluster of nineteen, grown upon a single stem, weighed seven pounds. There were fine Hubbardston Nonesuch, an apple which we cannot too highly recommend for New England culture, from Charles F. Putnam, of Salem, and S. H. Brockelbank, of Georgetown.

In the cultivation of fruit, particularly the pear, we apprehend that a judicious selection of soil and exposure is most important; many of our fine varieties when produced on a light sandy loam are poor and almost worthless, while the same sorts, when grown upon what we denominate a strong, retentive loam, are large, fully developing their fine character; we therefore believe that it is now the greatest desideratum in the culture of the pear, to ascertain what varieties to cultivate on a given soil.

In the recommendations which have been made from time to time, of the best varieties of pears for general culture, (irrespective of soil,) many and great mistakes have arisen. Thus, for example, the Beurré d'Aremberg, Wilkinson, Lewis, and some other varieties, will almost invariably disappoint those who grow them upon a light porous soil. There are, however, some sorts which, like the Baldwin and Hubbardston Nonesuch apples, accommodate themselves to various soils. Among these are the Bartlett, Beurré Bosc and Thompson, early fall fruits, and the Lawrence and Winter Nelis for winter—these are all first rate fruits. The Bloodgood, an early pear, and the Belle Lucrative, a fall variety, are higher flavored and better developed upon a light, warm soil. The experimental knowledge con-

cerning the proper soil for the finest pears is of the utmost importance in the cultivation of this fine fruit.

JOHN M. IVES, *Chairman.*

Report of the Committee on New Fruits.

The only fruits exhibited for the premiums offered by the society, subject to their awards, were two varieties of grapes from Mr. James Blood, of Newburyport; that were presented, as coming within the conditions entitling them to the first and second prizes, offered for seedlings of this species of fruit. The premium was, "for a new variety of native or seedling grape, of decidedly superior quality, ripening in this county in the open air, by the middle of September, prolific and suitable for the table." These grapes were examined on September 12th, by one of your committee, who found them then, as he states, "ripening in the open air, prolific, &c." Mr. Blood represents that these grapes were raised from seeds of a Malaga raisin, sowed in pots, and transplanted into the open ground—that they have been in bearing for eight years, and have never, during that period, failed to produce a crop, he farther says, that this year they were fully ripe in the last week in August, and that consequently when exhibited, they had lost the peculiarly rich and delicate flavor that distinguishes them from other grapes.

From this, it would seem, that the grapes of Mr. Blood, "if of decidedly superior quality"—were justly entitled to the premium of the society; for certainly those of the character here represented, would be considered an acquisition to our somewhat limited stock of grapes suited to out-door culture—but yet your committee hesitate to make such award.

It is very difficult, and must be dangerous, to form a decided opinion respecting the quality of any fruit from testing it once only, and then perhaps but a few specimens, because all fruit growers know that not only many species, but many varieties of the same species vary much in quality in different years. This is especially true of grapes, that seem to be peculiarly subject to the contingencies of the season, and whose adaptation to general cultivation can only be ascertained by a some-

what extended experience. These grapes have, it is true, been proved by Mr. Blood, for several years, but your committee have seen them but once, and responsible to the society and the public therefor, they can make their award only upon their own examination and judgment.

In the Massachusetts Horticultural Society no new seedling fruit can receive a premium until it has been tested from three to five years in succession, and the reasons that led to the adoption of such a rule, apply forcibly to the case now under consideration. The premium offered by the society is a liberal one, and its award is a matter of moment, not to the society and competitor only, but the public, because such award gives the assurance and pledge of the society, that the fruit, to which it is made, is worthy of an extended cultivation, a warrant that should not, as your committee think, be given until authorized by such repeated examinations as will greatly tend to prevent the commission of error.

For these reasons, your committee, thinking that they have not had sufficient opportunities of testing them, to feel certain that they fully answer the conditions required by the society, while entertaining a very favorable opinion of their merits, have refrained from awarding premiums at this time, to Mr. Blood's grapes, and recommend to the trustees the withholding of such, until by further trials their claims shall be more clearly established.

JOSEPH S. CABOT, *Chairman.*

From the Report of the Committee on Vegetables.

To this committee were assigned those productions of the vegetable kingdom, not classed among the fruits, as the apple, pear, quince, peach, plum, grape, &c., or the lovely and beautiful flowers; these were placed under the charge of other committees.

The collection was very good, exceeding that of any previous year. It was very promiscuous, including varieties of corn, squashes, melons, tomatoes, cabbages, celery, onions, potatoes, beets, &c., some of these are the ripened fruit, some the

pericarp or receptacle of the seed, some the leaf, some the bleached leaf stalk, some the matured bud, and others the root; nearly every part of the plant is represented, in one or the other of the above-named varieties, and is used for culinary purposes. Various modes of treatment are requisite, to bring to a high state of perfection the development of that particular part, for which the respective variety is cultivated. It is incumbent upon all societies, having for their object the improvement of the soil, to diffuse the necessary information, and to excite a spirit of research and inquiry in the community, more especially the agricultural portion, respecting this important subject.

The number of contributors to this department was fifty-two, as follows: From Lawrence, nineteen; Methuen, twelve; Andover, eleven; Danvers, two; Haverhill, Topsfield, Middleton, Lynn, Lynnfield, Beverly, Marblehead, and Salem, one each.

It will be perceived from the above, that the greatest number of the contributors were from Lawrence, or its immediate vicinity—very few from the other sections of the county. The unpleasant condition of the weather during the first day of the exhibition, undoubtedly, prevented many, more especially those residing at a distance, from sending contributions.

Your committee were highly gratified with the fine accommodations furnished for the display of the various specimens. The additional amount placed at their disposal to be awarded in gratuities, exerted a favorable influence towards increasing an interest in this department of the exhibition. They recommend that an additional amount be appropriated the next season, and that the society in future encourage, with a high degree of liberality, this branch of agriculture, so important to the interests of this county. They sincerely trust, that in future, contributions will be received from all sections of the county, and not be confined, as it frequently happens, to the immediate vicinity of the place where the exhibition is held. They respectfully request all cultivators of the county, to visit the exhibition the next season, to bring specimens of all their products, and those who cannot attend personally, to send the same by one of their neighbors. It is not necessary to bring

large quantities of any one article, but a small sample of all—as the varieties of Indian corn, rye, wheat, potatoes, beets, squashes, &c. &c. The public will then have an opportunity to form a fair and impartial opinion of what can be raised in old Essex. This county has materials within herself to make a grand display. If farmers and amateurs will only make a little exertion, this object will be accomplished.

H. Wheatland, *Chairman.*

MIDDLESEX.

Report of the Committee.

The show of pears was very fine, and your committee deliberated long in making some of the awards, so nearly balanced were the claims of the competitors. They would gladly have awarded further premiums to some of the very fine dishes of pears offered for competition, had it been in their power to do so; and they desire to make particular mention of the superb Duchess d'Angouleme, weighing twenty ounces, exhibited by Mr. Nesmith, of Lowell, which would have received the first premium for the best single dish if they had been exhibited in season.

Your committee take this occasion again to recommend the cultivation of the pear on the quince. Many of our choicest pears can only be grown to perfection on this stock; and they are more hardy, more prolific, and come much earlier into bearing when worked upon the quince than upon their own roots, and their dwarf habit of growth adapts them to the smallest garden; six or eight feet square being sufficient space for them. They may also be transplanted successfully at almost any age, by reason of the abundant fibrous roots which the quince makes near the surface of the ground. Thus the tenant may take his trees with him as easily as his roses; a thing impossible when the pear was worked upon its own roots.

Perhaps a few hints, drawn from the experience of some of your committee, in regard to the selection and cultivation of the pear on the quince, may guide the novice who has hitherto

foreborne their cultivation, in the belief that it was difficult in itself, and that he would have to wait half a lifetime for his first fruits.

The best soil for the pear is undoubtedly a stout loam, leaning to clay, but friable, and not wet in the winter, nor liable to crack in the summer. Such a soil is retentive of moisture and of manure, and has the property of holding potash with great tenacity; a manure which is of great importance to the pear.

If the purchaser is not in haste to see his first fruits, but desires to have the best formed trees, he will buy them of rather small size, as the roots will be less likely to be mutilated in the transplanting, and the tree will be more easily led into the shape he desires to give it, whether standard, pyramid, or espalier; this last form being only necessary against a fence, or with some very tender kinds. We think the pyramid the most natural and beautiful form and would recommend our readers to go to the nurseries of Messrs. Hovey & Co., in Cambridge, to see the finest specimens of pyramidal training in the country. The lower branches should be very near the ground, and the leading shoot should be pruned or pinched back at such distances as will compel the formation of successive tiers of branches at proper distances, say twelve to eighteen inches.

In planting, dig a hole three feet deep and three feet in diameter. If your soil be light, put into the bottom of the hole three inches in depth of clay; if it be heavy, put ten or twelve inches of stones to secure a good drainage. If you have perfectly ripe compost, mix it liberally among the earth about the roots; if your compost is raw, put it in the bottom of the hole and cover it with earth, and let nothing but the mellow earth come in contact with the roots. Plant three or four inches above the level of the ground to allow for the settling of the earth; press the earth gently after planting, and, if dry weather ensue, mulch with a little fresh grass; if the earth gets dry, water at evening, taking care not to water too much, as this soddens the roots, remembering to keep the ground moist but not wet.

Bone dust is a very valuable manure for the pear, as is also ashes; one quart of the former and two quarts of the latter,

may be mixed with the surface soil annually, and one pint of guano dug into the surface to the depth of two or three inches, in the autumn, will be found greatly to increase the growth and fruitfulness of the tree; this for trees of five or six feet, for smaller ones in proportion.

The tree is now planted in soil trenched to the depth of three feet and the diameter of three feet. As soon as the roots have extended to the verge of the dug ground, dig a trench round the tree outside the roots one spade in width and to the same depth as before, manuring also as before, and repeat this annually until the whole ground is trenched. It is better, however, to trench the whole ground at once, if convenient, but if not, the mode we suggest will be found to be perfectly successful.

If very large specimens are desired, cover the ground about the tree in the autumn with five or six inches of horse manure, and water with guano in the summer,—two pounds to the barrel of water will be enough,—and thin out all inferior fruit.

The cultivator will find the best remedy against sun blight in training his trees in pyramidal form, the low branches shading the stem from the ardent heat of the summer sun. But this blight sometimes occurs in winter, and generally upon the trunk of the tree. If the trunk or stem be not protected by its own branches, it is best to shade it by evergreen branches, or by narrow strips of board put into the ground on the south side of the tree. Sheltered places are best for the pear, as the tender leaves are sometimes injured by high winds, and the fruit shaken off.

Your committee suggest the following list of varieties for cultivation, which, though by no means complete, will, it is believed, give satifaction to the cultivator.

For *Summer.*—Madalene, Bloodgood, Dearborn's Seedling, Rostiezer, English Jargonelle.

Fall Pears.—Bartlett, Belle Lucrative, Flemish Beauty, Seckel, St. Michael's, Urbaniste, Beurré Diel, Louise Bonne de Jersey, Vicar of Winkfield, and Duchesse d'Angouleme.

Winter Pears.—Winter Nelis, Passe Colmar, and Beurré d'Aremberg.

E. W. Bull, *Chairman, pro tem.*

Statement of Edmund Tufts.

I take pleasure in presenting for premium thirteen specimens of the real genuine St. Michael pears. This tree is twenty-five feet in height, and was engrafted by my father, the late Joseph Tufts, about forty years ago. The fruit of this tree has been of so little account of late years that they were scarcely worth picking, and consequently much neglected. Last year the tree bore several dozens of pretty fair pears that found a ready market at thirty-seven and a half cents per dozen. This year I was enabled to obtain a bushel that were not cracked at all, and which were purchased, at the hall of the Mechanic's Fair, by Mr. George H. Childs, confectioner, at his own offer, which was four dollars for a bushel.

Somerville, October 4, 1853.

These pears—although possessing some interest as evidence of the recovery of the St. Michael pear from the blight which has so long defeated the hopes and efforts of cultivators—were surpassed in size and beauty by many other dishes of the same kind.

Mr. Tufts does not state whether he renovated his tree by pruning and manuring, as has been sometimes done with old trees of this variety.

From the Report of the Committee on other Fruits.

The committee chosen to examine all other fruits, excepting pears and apples, have attended to their duty and beg leave to report. They were highly gratified with the beautiful display of every variety of fruit of the season, in this bright and sunny, though temperate climate. The peaches were in great abundance, and very fine for the season, many worthy of a premium.

The show of grapes was magnificent, and the committee were pleased to see so much attention paid to the cultivation of this beautiful fruit, which has been heretofore sadly neglected. Long before other fruits were cultivated, much attention was paid to the cultivation of the grape, by the Persians and

Syrians; and although not a native of Europe, it was long since brought from Asia, first to Egypt, thence to Rome and France, and thence to England by the Romans, six hundred years after the Christian Era. It has been extensively cultivated for wine, for drying, and as a desert fruit. As the foreign varieties have never thrived in open culture in this country, it is highly necessary that we should turn our attention to our native grapes; and should the same attention be paid to the grape as to the improvement of other fruits, we shall, ere long, undoubtedly produce as fine varieties as those of other countries.

There were but two varieties of plums offered, being beautiful specimens of Coe's Golden Drop. There was so little choice in the two, the committee were divided in opinion. Two baskets of fruit were also offered.

BENJAMIN WHEELER, *for the Committee.*

WORCESTER NORTH.

From the Report of the Committee.

The committee on fruit congratulate the association on the fine display exhibited, and the great improvement which the few years since the first exhibition have made in the horticulture and orcharding of our neighborhood. Although, from the lateness of the season, but few of the earlier fruits could be presented. The show of apples, pears, quinces, and the later fruit, was excellent. The association are much indebted to John Milton Earle, Esq., of Worcester, for his unrivalled display of pears, consisting of seventy-one varieties, which was in itself an exhibition worthy the diligent study of all cultivators of this delicious fruit. The committee regret that by the rules of the association, they have no power to bestow any more substantial reward than their thanks, for this fine addition to our festival.

The main feature of the exhibition, excepting the specimens of Mr. Earle, were the apples; and the collection was large and highly gratifying, both from the variety and the excellence of the respective samples. And the committee, after a few of

the first and most marked selections, were much embarrassed in deciding on the merits of particular offerings.

The show of pears also, from our vicinity, was most creditable, and our quinces and grapes were in excellent condition.

It would be grateful to the committee, to enumerate and refer in terms of praise to many of the specimens to which they were unable to award premiums without increasing their list beyond the just bounds of selection, but which were most highly creditable to the cultivators, and will, we trust, return a rich reward.

Among the curiosities of the exhibition, the committee noticed a plate of full grown cherries, in good condition, picked from a tree in his garden, on the day of the exhibition, by Mr. Elliot Wood, of Fitchburg.

J. W. Mansur, *Chairman.*

HAMPDEN.

From the Report of the Committee.

The collections, for various and obvious reasons, are mostly small, at the present exhibition, but contain some specimens of rare merit. Very few apples and peaches were on the stand, but they were generally excellent. The latter were all of that variety known as Crawford's Late Melocoton, and could hardly be surpassed.

We would especially call attention to the large and choice collections of pears exhibited by Messrs. Bliss & Haven, and by Mr. D. C. Brewer. These, with other fine samples from the gardens of our citizens, show not only that more attention is being devoted to the culture of this delicious fruit, but also that our soil and climate are well adapted for that purpose. We doubt whether finer specimens were ever produced than some of those now in this exhibition.

We naturally inquire then, why the pear culture is not more extensively pursued? Why does not every one who has a spare corner in his yard or garden plant a tree, dwarf or standard? And why do not our cultivators supply our markets with the finer varieties in sufficient quantities for table use?

It is not because "it will not pay." No crop would pay better. It is well known that pears of first rate quality readily command extravagant prices; and it is certain that our home market, at least, might be supplied with the best varieties at a much greater profit to the producer than those which are ordinarily presented for sale, and which are unfit for the table till cooked.

We suppose one reason for the neglect to which we refer is this, viz.: the inferior fruits are more easily produced. All our best, and all even of our good varieties are artificial products. They are the result of skill and care in culture, and demand more attention than those which are at a less remove from the original or lowest state. The common sour and Mazzard cherries, the fox-grape, the crab-apple, and the choke-pear can be produced with little or no care. But the good, and especially the best varieties of each of these fruits require, both in planting and training, closer attention, and a more generous culture. But they will more than repay the necessary additional care and expense, as all will be sure to find who will try the experiment.

Another explanation of the neglect to cultivate the best varieties of pears, is found in the fact that the proper methods of treating and ripening the fruit are not generally well understood. It is left on the tree till decayed at the core, and then regarded as worthless, because "it will not keep;" or it hangs till the autumnal frosts arrive, and as it then presents no indications of fitness for any other use, is handed over to the cook. But the late autumn and winter varieties can be well ripened only after they are taken from the tree and placed in rooms of the proper temperature, while most of those which are earlier are much better when picked before they are fully matured, and ripened in the house. A fact illustrative of these remarks has come to our notice within the last week. One of our citizens has a tree that annually produces several bushels of the Beurré Diel pear; but not knowing the variety, and neglecting to ripen it in the fruit room, he has hitherto given over the entire crop to the cook, thinking it worthless till subjected to a culinary process. And yet a more valuable and palatable dessert fruit could hardly be placed on the table than a well ripened Beurré Diel.

It is much to be hoped that a larger share of attention will be given to raising this and other fruits for table use. With proper enterprise and pains on the part of producers, an abundance of pears and grapes, fit for the dessert, may be introduced to our market, making desirable additions to the strawberries, cherries, peaches and apples, with which we are now so highly favored, and affording large profits to those who raise them.

In taking leave of this topic, your committee would make favorable mention of a small vineyard belonging to Edwin Booth, Esq., and which they were invited to view. They found on a small spot of ground—about forty square rods—the Isabella and Catawba grape submitted to vineyard culture and doing well. The vines were bearing profusely and ripening quite satisfactorily. On the whole, your committee regard it as a successful experiment, and advise others to do likewise, and push the fruit into market. The demand, we venture to affirm, will keep pace with the supply of good and well-ripened grapes.

R. H. SEELY, *Chairman.*

AGRICULTURAL IMPLEMENTS.

MIDDLESEX.

Statement of A. W. Putnam.

Horse Rackets.—Having had considerable experience in using horse rackets for the last five years, I wish to communicate to you, and through you to the public, some improvements which I have made, so that my brother farmers who wish to reclaim their wild and uncultivated meadows, and make them the most productive and beautiful portions of their farms, may avoid some of the troubles and vexations I have met with. I commenced with a set of the style marked No. 1. I found two serious objections; first, they chafed the ankle where the strap buckled around it; second, as the foot had but one bearing on the bar, constant use, day after day, made the bottom of the foot quite sore. I then took a set of the style marked No. 2.

They also had two great objections, but entirely different. First. It was very difficult to keep them on. Second. They had to be made with so large a proportion of the wood front of the foot, that it was very hard for a horse to work with them. After I had had any reasonable amount of trouble with these, I invented and made a set of the style marked No. 3, which worked well, and seemed for a while to obviate every difficulty; they were much liked in this vicinity; some twelve or fifteen procured sets of them. They worked well while the straps were new and strong, but with constant use they would not continue so but a short time. After using them one season, I found the cost of straps, together with the time it took to mend and replace them, quite a heavy item. I then tried to substitute iron for leather, and at last succeeded. The result is set No. 4, to which I would call your particular attention. The woods are new. The irons were made last season, and are the first ever made. They have worn out one set of woods. They are easier for a horse than any other kind I have ever seen. They are fast taking the place of all other kinds in this vicinity; we have no trouble now with chafed ankles, sore feet, rackets off, a horse in the mud, broken straps, &c. &c. I wish all who have occasion to use rackets, to have the benefit of this style until they can get something better.

Lexington, October 4, 1853.

HAMPSHIRE.

From the Report of the Committee.

Inventive genius is progressive. It never ceases in its constant and untiring efforts. Its motto is "Excelsior," and its aim, perfection. Onward and upward, ever has been, and ever will be, its triumphant march. No obstacle, however difficult, seems to impede its course,—no eminence is too high for it to surmount. Like a mighty river, wide and deep, that flows fearlessly over rocks and through mountain defiles to the sea; the genius of invention moves on with irresistible power. At the present day, the creations of mechanical genius rise up around us in so many multiplied and surprising forms, that we

are astonished and awed. While we survey with delight and admiration, one of her recent combinations, another and still another appears, more wonderful and pleasing still. Our wives, whose mothers and grandmothers were obliged to card, spin, weave and knit nearly every wearing fabric in use, are relieved of such drudgery, by the invention of the power-loom. Machinery accomplishes the work, in a hundredth part of the time and, I was about to say, with a hundredth part of the expense. Our wives and daughters can now devote their time to other employments, quite as useful as spinning or weaving, and far less laborious and irksome. The old fashioned hand-cards, spinning-wheel, and loom, are curiosities, at the present day. I well remember the monotonous hum of the spinning-wheel, and the delight I took in seeing my good old mother warp and weave; but little thought how tedious and severe was the labor. Thanks to the "mechanic arts," for the safe package of the whole paraphernalia in some dark corner of the garret!

All trades have received a new impulse, and are carried on with comparative ease and despatch. We may cite the splitting and shaving of shingles; the manufacture of wheel-spokes and felloes; the shaving and shaping of axe, hoe, and broom handles; of barrel-heads and staves,—all which processes were formerly done by hand; but are now performed by ingenious and much admired machines, contrived by American genius, Among the improved tools, we may name the axe, saw, chisel. plane, and all kinds of carpenters' tools, which are less clumsy, of better material, and of higher finish. While examining, not long ago, some beautiful bench tools, manufactured by our own, mechanics, we could not but revert to the "pod augur days" of yore,—the contrast was so striking, between the olden and modern implements. A pod augur! Did you ever see one? And could you ever solve the problem satisfactorily to your own mind, how any mechanic, though a Hercules in strength, could penetrate twelve inches into seasoned oak timber with a square-ended gouge, yclept a pod augur? As for us, the hardest problem of Euclid were an easy task to it.

In the olden time, travelling was done principally on horseback. It was not uncommon for a gentleman and lady to ride upon the same animal, at the same time; the gentleman upon

the saddle, and the lady, behind, upon a pillion. Wagons were next contrived, but of very rude character, as many of us well remember; consisting of four wheels,—two very large, and two in front very small, with wooden axletrees, and a canoe-shaped body perched directly upon the axletrees. Add to this a high-backed wooden seat, upon a pair of wooden springs, and you have the pleasure and business carriage, common among us, forty years ago. A little later, came the chaise and the thorough-braced wagon, hung upon straps of leather; and at length, within a few years, the elegant four-wheeled, steel-springed carriages, of varied form, so convenient, beautiful, and easy, let the highways be ever so rough or smooth. There are those living, who have journeyed both in the ancient and modern vehicle; and whose rheumatic joints, if they could speak, would bless the modern carriage-makers.

But we must not omit the improved implements of husbandry. In no art has there been a more marked advance. New tools have been invented, and old ones improved, until farming has become comparatively an easy task. Look at the plough of to-day; and then at the uncouth, wooden, iron-sided thing, bearing that name, of thirty years ago. What was it? A heavy wooden beam, with a wooden mould-board, plated with straps of wrought iron, to which was fastened a wrought iron nose of clumsy construction. It was a heavy, cloggy thing to manage, both for man and beast, and did its work badly. Compare this implement with the cast-iron plough of the present day, and comment is unnecessary. Hoes, too, have received the finishing touch of the mechanic. Those presented by Messrs. Graves & Hatch, of North Leverett, were the most beautiful and perfect articles of the kind, we ever saw. Formerly, a hoe was a flat, thick, square piece of iron, with a ferrule welded upon one side, into which was fastened a handle; an unwieldly, tiresome tool, heavily taxing the muscles of the laborer. Now a hoe is just what it should be; a well-formed, polished steel plate, rightly proportioned and tempered, lithe, light and flexible; with a well-formed socket for the handle and, when finished, it is an ornament. About the same difference may be observed between other agricultural implements of old and modern times. The pitch-fork and manure-fork, for-

merly, were huge, misshapen things, of very clumsy construction, and resembling the fork of "Old Nick," or the trident of Neptune in the picture books. Now, a fork, whether for pitching hay or manure, is as light and pliable as a willow stem, yet strong and not easily broken. Formerly, all kinds of grain were cut with the sickle and cradle. Now, the reaping-machine does the work in a twentieth part of the time. It was threshed out with the flail, with a great deal of hard, dirty labor, and winnowed with a hand fan, an implement resembling a coal-box with one of its sides knocked out. Now, the threshing-machine and winnowing-mill prepare the grain with much ease and nicety for the granary, with much less cost and labor. By means of better scythes, and the horse-rake, at least one-half the expense of making hay is saved. The cultivator and seed-planter save a vast amount of labor formerly done with the hoe.

The American farmer has great reason to be proud of the inventive genius of his countrymen. Ours is comparatively a new country, and want, which is always a prominent feature in a new country, sets genius to work. American ingenuity has not only equalled in its developments the mother country, but outstripped her, for our wants, and consequently our efforts have been greater. The peculiarity of American genius is its highly inventive character. Nor is it exactly like that of any other country. It picks their locks; it invents and fashions a vessel that outsails, on their own waters, before their own eyes, all their boats, brigs, schooners and yachts, and leaves them tugging behind, like a school of tired porpoises. They look amazed, and are ready to burst with vexation to see Jonathan behave so. We have shown to the world the most ingenious machine ever made in any country for cutting grain. We could cut over some of the small kingdoms of Europe with that machine, about as soon as any of the inhabitants could reap half a dozen acres with a sickle. We make the best ploughs and scythes; India rubber goods, and the sweetest toned musical instruments. We invent the queerest machinery for saving manual labor, and contrive to have the best wives and the prettiest daughters found in any country.

DAVID RICE, *Chairman.*

NORFOLK.

From the Report of the Committee.

The committee on agricultural implements report that it is due to Mr. Henry Partridge, Jr., of Medfield, that the exhibition was not perfectly barren of those articles which most appropriately symbolize the great science of agriculture, and which, as much as any thing, mark its progress and contribute to its success.

The articles constituting the largest collection, were gathered in one of the city warehouses, and comprised a sample of the ordinary implements of agriculture, such as have been in common use. The premium was offered, to induce manufacturers and dealers to add to the interest of the exhibitions by presenting articles so intimately connected with agriculture, and so indicative of the progress of the art.

The changes and improvements which have been made in agricultural implements in the space of ten or twenty years, are marked and significant, but from year to year, it is difficult to discern, in the ordinary implements, any remarkable alterations. In the annual list of patents there are many in the agricultural department which are designed chiefly for the sections where farming is done on a far larger scale than here in New England. The character of our soil, and its rough and uneven surface, obstruct the operation of those labor-saving machines, which have been so extensively introduced into the Western States, including, also, the State of New York.

During the year 1852, letters patent were granted for inventions and improvements in agricultural implements in number as follows: churns, nine; corn shellers, two; cultivators, three; grain separaters, four; harvesters of grain and grass, twenty; hoes, one; hullers of rice and buckwheat, three; seed planters, twenty-four; ploughs, fourteen; potato diggers, two; potato washers, one; rakes, four; straw cutters, four; threshers, four; winnowers, four; ox yokes, three, and some others; and among all the hundred patentees, not more than two or three are from the State of Massachusetts, and not more than six from all the other New England States.

By reference to the catalogue of the machines and implements on exhibition at the Crystal Palace, it would appear that, at last, even in the agricultural department, labor was about to be nearly all performed by the power of steam or the strength of animals, and that intellect and intelligence, and not muscle, are to be the chief capital of the farmer.

An unnecessary alarm was excited some years ago, lest the multiplication of substitutes for human labor would so cheapen it, that men would find it difficult to gain employment, and if they should chance to find it, the wages would be too little to support them. The prospect of a railroad from the West, sent terror at one time into the breasts of our farmers, lest the cheap productions of the prairies should render those of their own soil valueless; but fears of that description have long since vanished. The more railroads, and the more labor-saving machines, the higher the prices of agricultural products. It was not uncommon to find flour selling sixty miles from the sea-board, in Massachusetts, twenty years ago, at $5.50 per barrel, while at the same place at this time it will bring $3 more, notwithstanding all the improvements of modern times. There is no danger, therefore, that the products of agriculture will suffer for the want of purchasers, until a new order of things shall dawn; but, on the other hand, there is danger, that owing to the facilities afforded to speculators, we shall be forced to pay starvation prices for provisions, while cargoes of flour and corn, of American growth, are selling at half-price, or moulding in the overburdened ports of Australia and California.

E. L. KEYES, *Chairman.*

FRUIT CULTURE.

From an Address before the Essex Society, Sept. 28, 1853.

BY JOSEPH S. CABOT, ESQ.

Upon the cultivation of fruit, both on account of its intrinsic importance, as well as that it is at this time a matter of very general interest, I propose to make some observations:— The apple, I am inclined to think, is the fruit best adapted to general cultivation in New England, and the one whose cultivation will be found most profitable. The tree is a hardy tree, now thoroughly and entirely acclimated, is not subject to disease; it will grow and flourish in almost every soil, unless a dry sand, or wet swamp. It bears abundant crops, its fruit is of universal use and commands a ready sale, and will be found, it is thought, in the long run more profitable for cultivation than more delicate fruits requiring more care, though such, when in perfection, find a sale at a high price. Apples too, especially sweet apples, may be used as food for animals— cows and swine, and any surplus in the crop, or such as are unsuited to market, may in this way be disposed of with advantage. There exists among farmers such universal experience in the cultivation of the apple, that to say much upon the subject seems an unnecessary tax upon your time, unless it may be that cultivation of some kind is essential to a healthy, vigorous growth of the tree, and to a crop and perfect fruit. If an orchard is worth setting out, it is worth cultivating; the ground beneath and around the trees at least should be kept broken up, mellow, free from weeds and properly supplied with nourishment, otherwise the trees become dwarfed and stunted, and the fruit, if ever produced, small, knurly and inferior; and yet it is no unusual thing to see apple trees set out in grass land, where the young trees cannot thrive. If the ground of the orchard cannot be wholly spared from other purposes, it should be devoted to the raising of root or other crops, that call for cultivation, and the application occasionally to the soil of manures— and should not be laid down to grass until the trees have attained age and size; even then, this will be attended with diminution of vigor to the tree, and of perfection to the fruit. When

the raising of apples, for the market is pursued as part of the business of the farm, probably the best course to adopt, is, to devote a portion of it to this purpose and to keep such in high condition, by constant cultivation; indeed, under no other circumstances, can some varieties of this fruit, as the Williams Favorite, for instance, be produced in perfection. The object of the cultivator, should be to produce the greatest crop of fruit, in its highest state of perfection, and in no other way can this be reasonably expected, but by keeping of the soil in proper condition and suitably supplied with nourishment.

The varieties of apples are so numerous,—there being in in almost every district, some one of local origin, the knowledge of which may be confined to such district, that every one in making a selection of varieties, must to some extent depend upon his own taste and discrimination; still there are many varieties of established reputation, that may be recommended for general cultivation. Among such of the earlier varieties, may be named the Early Harvest, and the Putnam Harvest, of, I suppose, local name and origin—a great bearer in alternate years, less acid than the Early Harvest, and therefore better suited to the dessert—the Early Sweet Bough, the Red Astracan, and Williams Favorite; of the autumn varieties, the Fall Harvey, the Porter and the Gravenstein; and for winter, the Hubbardston Nonesuch, the Hurlburt, the Westfield Seek-no-farther, the Minister, Rhode Island Greening, Baldwin, Hunt's Russet and others; while, for sweet apples, there is the Seaver's Sweet, the Danvers Winter Sweet, and for late keeping, the Ladies' Sweeting, and an apple from Portsmouth, a Seedling, known there as the Ledge apple.

The Baldwin is so universal, and has been so long an established favorite in this county, that its cultivation has, to a considerable extent, superseded that of other winter varieties; bearing only in alternate years, and then usually most abundantly, it is becoming at such times, from its abundance, a drug in the market; on this account farmers will probably find it for their advantage, if in place of, or addition to, Baldwins, they would cultivate some other varieties, for this purpose the Hubbardston Nonesuch, Hurlburt, Minister, and Hunt's Russet, may be perhaps selected with advantage.

The cultivation of the pear for some time past has occupied much attention, especially with amateurs, even to the exclusion of that of every other species of fruit. For the dessert it is the most valuable one we possess, the range of its season extending through nearly the whole year. Its varieties are very numerous, some collections in this county containing many hundreds of different names. The pear tree, though hardy, is less so than the apple, and in selecting a site for a pear orchard, care should be taken to choose one somewhat sheltered, a slight declivity sloping to the south or west, or level, defended on the north and east, affords perhaps a preferable situation. The high winds that prevail in our climate, and the intense heat of the sun, should both be guarded against, and from the evil effects of both, sufficient protection may perhaps be found in close planting—not sufficiently close, however, to impede a free circulation of the air, for this is essential to the production of fine fruit, a manifest difference being apparent between that grown under this condition and that, when from some cause this free circulation is much obstructed. If sometimes injurious to the tree, the great heat of our climate, particularly in August and September, when the heat of the day is succeeded by cool nights, is favorable to the fruit, in maturing its juices, and bringing its flavor to the greatest perfection. The roots of the pear tree, especially while young, require protection, and this may be afforded by a covering of litter, thatch, straw, spent tan, or similar substances. It is not so much the severity of the cold that is to be guarded against, as the heaving the ground caused by its repeated freezings and thawings; and to the effect of winter, may the loss of young pear trees, that so frequently occur, be usually ascribed, rather than to those causes to which this destruction is commonly imputed. Whatever covering may have been used to protect the roots in spring, should be left round the trees in summer, to operate as a mulching, that, keeping the ground moist and cool, tends to promote their health and vigor.

Proper attention should be given to the preparation of the ground, before planting, by draining, where necessary, to get rid of stagnant or under-ground water—by deep ploughing, or better, by trenching, that the roots may readily extend to a

sufficient depth, that the air and heat may penetrate it, and the rain pass through it, and it should be made sufficiently rich by manure, if not already so, for a crop of corn. In planting, the holes should be made larger in diameter than the extent of the roots, and the tree should not be set too deep. It is an operation that with care, may be performed successfully in either autumn or spring; the former, especially for large trees, seems to me the preferable season, the ground being then usually in a better condition.

The pear tree seems to thrive best in a deep, rich, moderately moist, not wet, clayey loam, though so far as the fruit only is concerned, all varieties do not seem equally suited to the same soil, some apparently arriving at greater perfection, in a stiff, others in a light soil. For orchard or open culture, pears should be grown on their own roots; in gardens, they are frequently cultivated on the quince; for this, however, some varieties will not answer, seeming never to thrive, or to become perfectly united with the stock; while there are others, that appear to assimilate to, and become completely incorporated with, the quince. There is evidently a great difference in the growth of different varieties of pear trees, some being of strong, rapid, vigorous growth, others, of weak, slow and feeble habit. In grafting or budding the different varieties, attention should be paid to these differences, so as not to work a strong growing variety upon a feeble stock.

The pear tree is impatient of the knife, and the removal of large limbs, when rendered necessary, is not unfrequently attended with injurious consequences—no other pruning is called for, than that required for the removal of cross limbs, and the proper shaping of the tree.

The proper cultivation of the pear has been, perhaps, sufficiently indicated, by what has already been said. The ground round the trees, at least, should be kept loose, mellow and free of weeds, and covered with a suitable mulching of litter, spent tan, or like substance, and made sufficiently rich to sustain a healthy, vigorous growth, for which purpose the application to the soil of peat, or meadow muck mixed with wood ashes, and an addition of ground bones, is considered suitable. Guano, mixed with the bone black of the sugar refineries, in the pro-

portion of one-fourth of guano to three-fourths of bone black, and Mape's improved super-phosphate of lime, as manufactured for sale, will, as I believe, be found a proper and efficacious manure for orchards.

Rain water, in copious supply, seems to have a highly stimulating effect upon the fruit as well as the tree, and where fruit of extra size is desired, in addition to a due supply of manure, and thinning of the fruit, copious waterings with rain water will probably materially tend to this result.

The number of varieties of the pear is so great, very many of which have not yet been thoroughly tested, that it is not easy to decide which are the best; and much less so to point out those most suited to orchard culture, and to that only are these remarks intended to apply, as for this purpose many circumstances must be taken into consideration, such as the size and quality of the fruit, the vigor, hardihood and productiveness of the tree, and others that may affect its adaptation to general cultivation. The safest course for beginners in cultivating this fruit, is to confine their selection at first to such varieties as have been thoroughly tried, and are of established reputation. I do not intend now, to recommend any varieties as worthy of general cultivation, but in order not to pass the subject wholly by in silence, will name a few about which among fruit growers, no great difference of opinions exist. The Madeleine is usually considered the best very early pear, but seems in danger of being superseded by the Doyenné d'Eté, a small, but handsome, fruit. Manning's Elizabeth, one of Van Mon's, unnamed pears, so called by the late Robert Manning, promises to be adapted to orchard culture, as does the Beurré d'Amalis, a pear of large size, though not of the first quality; the Rostiezer, a small but exceedingly high-flavored variety, and that universal favorite, the Bartlett, flourishing apparently every where, and under all circumstances. All these may be considered summer pears. Among the autumn varieties, of such as are in general highly esteemed, that seem suited to general cultivation, may be named the Andrews, of American origin, the Golden Beurré of Bilboa, the Swan Orange, the Bonne Louise de Jersey, the Seckel, the Belle Lucrative, the Urbaniste, the Beurré Bose,

and the Fulton. Among the best winter pears are the Lawrence, a native fruit from Long Island, the Winter Nelis, the Beurré d'Aremberg, the Cross, from Newburyport, the Glout Morceau, especially suited to the quince and Easter Beurré. The Columbia is a very large and handsome pear, but is so liable to be blown off, even by a very slight breeze, before it is ripe, as to be only suited to cultivation in very sheltered places, or when trained very low, and therefore not adapted to orchard culture. The Vicar of Winkfield, or Monsieur le Curé, is a very large pear, but though sometimes good, varies greatly in quality, and under the most favorable circumstances seems to require a peculiar process in ripening to fit it for the table; it is, however, a good bearer, and valuable for cooking. Among the best pears for cooking, may be named the Uvedale's St. Germain, or Pound Pear, and the Catillac. These lists might be much extended, but I have purposely refrained from mentioning the more recently introduced pears, because at present, and until more thoroughly tested, such seem better suited to the purposes of the amateur than the farmer.

At present, perhaps because they are less plenty, the cultivation of winter pears, when such are raised in perfection, is the most profitable, but perhaps it is the most difficult, requiring the most care in the cultivation; some varieties demand warm and sheltered situations, some to be assisted in ripening by some artificial process, while of none, unless it be for cooking, has their adaptation to orchard culture been perhaps fully tested.

The proper mode of ripening winter pears, is a matter of consequence to growers, and must remain probably for some time to come, a matter of experiment. With some varieties, as the Winter Nelis and Beurré d'Aremberg, no care seems necessary; such arrive at perfect maturity under any circumstances, but there are others, as the Vicar of Winkfield, that appear to require the aid of some particular process. Those requiring such assistance, may be placed in tight boxes, deposited in a cool, moist place,—though of course not exposed to frost,—where they may remain, until the usual period of the maturity of the variety arrives, when they should be removed to a warmer room. The ripening of some sorts of pears may

be retarded, and their season thereby prolonged, without injury to the quality of the fruit; but with others, this can only be done at the cost of loss of flavor; with them, when the process of ripening has once commenced, no attempt should be made to check it, or delay the period of maturity.

The preservation of fruits is an important matter, and one that has received much attention, fruit rooms or houses being frequently erected especially with reference to this object—such are usually constructed with hollow walls, and these filled in with charcoal dust, chaff, tan, or other supposed non-conductors of heat. In order to preserve it, fruit is sometimes put on ice, but by this method, if effectual for the purpose intended, the flavor and quality of the fruit is frequently injured. To preserve fruit in perfection, it is necessary to maintain a uniformity of temperature, and at a point below that at which fermentation usually occurs, say at from thirty-eight to forty-five degrees, according to the particular species or kind. Another condition essential to this purpose is a uniform degree of moisture in the air. To have some particular varieties of pears in perfection, it is necessary, while ripening, or to promote that process, to increase, by artificial means, the moisture of the air by which they are surrounded. A uniform degree of pressure from the atmosphere is also important, in order to prevent the shrivelling of the fruit. Although all these conditions are not attained thereby, perhaps the best practical mode, as yet ascertained, for the preservation or prolonging the season of any variety of fruit, is by the construction of rooms for the purpose on the principles referred to.

Fruit, especially apples and pears, it is hardly necessary to say, cannot be gathered too carefully, neither can too much care be used in placing it in the barrels or boxes; great caution, too, should be used, when it becomes necessary to move the packages in which they are placed, particularly with such as may be intended for export to distant markets; as slight bruises cause injury and early decay. Fruit should be gathered during dry weather, and not immediately after a rain.

DESCENT OF LAND.

From an Address before the Worcester Society, September 22, 1853.

BY HON. GEORGE S. BOUTWELL.

Agriculture, not immediately, but in the future, is interested in the policy of the government. I have said that it was the duty of the government to establish and maintain institutions of general and special learning, enact proper laws for the descent and distribution of land, and also to foster a liberal commercial system. In regard to institutions of learning, Massachusetts has done so much, if not always her duty, that there is no disposition and little cause for complaint.

The division, possession and descent of land, have furnished many difficult questions in economy, politics and social life. The government and people of Rome were often violently agitated by the disputes which arose concerning the public lands; and the elections of consuls and tribunes were generally determined by these questions. And in this country the land reformers have thrown new elements into the political cauldron, which, without their aid, would at any moment feast the eyes of the witches of Macbeth. The monopoly of the land by the nobles and church was one of the causes of the Revolution of 1789 in France, and the same cause has often threatened the peace of Great Britain. I do not now, however, intend to discuss it politically, but as a moral and industrial question. It is desirable morally, politically and socially, that a large proportion of the people should be landholders, but it does not therefore follow, as some would have us believe, that every man has a right to an equal portion, or a portion of the earth. For if so, why has he not a right to a horse or an ox wherewith to cultivate it? And if to a portion of land described by metes and bounds, why not to a portion of the seas, lakes and rivers? But no—neither the earth, nor the sea, nor any part thereof, was created for any particular man, but for the generations of men, through long successive ages, destined to possess, occupy and use, so that each shall work out the highest form of civilization of which it is capable.

The claim of the individual upon society or the state is satisfied when no unnecessary obstacle prevents the exercise of the powers with which he is blessed for his own greatest good and the good of his fellow men. A possession of land is not different in principle from any other possession. And we are to acquire and use property subject to one and the same rule, to wit, so as not to injure that which is another's. And this rule, I think, is the perfection of human reason. In all countries, governments have assumed to own lands. In some cases those lands have been granted to court favorites, in others, as compensation for distinguished public services, and in other cases still they have been sold to citizens without any discrimination. The right of a government to own such land as is necessary for public purposes, cannot be questioned; but beyond this, it can only properly hold it in trust for the whole people, to be sold to those who may wish to purchase and cultivate. And indeed if lands are to be held by non-cultivators they may as well be held by individuals as by the whole people. Therefore, while the policy of a government should be favorable to actual settlers and always regard their interests, it seems impossible to exclude speculators altogether.

Nor can it be admitted that those who desire land shall receive it of the government without price. The government, or in other words, the whole people, cannot acquire land without cost, either by purchase or conquest, more than individuals. Whatever that cost is, it has been paid, and upon what principle of morals or politics shall those who have bought lands with their own labor be required to give farms to those who have none? Those who have purchased of the government or of individuals, would be hardly treated if lands were conveyed to others as a gratuity. But on the other hand, the state may not hold lands for mere revenue or for purposes of speculation and gain. Our laws furnish a sufficient remedy for the evil of speculative purchases. If capitalists acquire large tracts, they must be broken up by the force of events under the guide of the general laws of distribution. And it will be remembered that the Roman law limiting a man's possessions in land was seldom enforced. The life of one man does not admit of great accumulation, and if the state did not create factitious personages

and vest lands in these creatures of the law, and if the general rule of distribution was inflexible, our system of titles could not be amended. The conclusion is, that justice requires that those who receive lands should pay, but that it is true policy by low prices to induce citizens to become freeholders.

We have no laws of entail or primogeniture in this country, but the two evils I have suggested are so near to those laws in principle, and so well calculated to work out similar results, that I think them worthy of consideration when we notice the influence of tenures and titles upon the agricultural interests of Massachusetts. The nature of the titles by which men or corporations hold land is not important to the present generation; but we ought to consider that Massachusetts is even yet in her infancy; that land is not valued here as in many parts of the world, and that every obstacle to its free sale and transfer will hereafter be accounted an evil. But I desire, gentlemen, that what I am about to say shall be received as suggestion rather than as opinion or argument.

And in this view, my first suggestion relates to what appears to be the extraordinary power of persons, by will or testament, to control estates after their own decease. And first, the law which permits this, does not seem to be founded upon any principle. We allow a person to provide, by will, that a particular estate shall vest, at his death, in a corporation existing or created for that object, and that the rent shall be applied forever to some eleemosynary or other similar purpose. The existence of such a power implies absolute property in land, equally as if we allowed a man to bequeath the income of his estates to his eldest son, and so on, by the rule of primogeniture, for ever. But we have admitted the former power, and refused the latter. I see not, I confess, why we should permit either. Upon principle, then, can we find a reason why the entailment of the income of estates, which is the whole estate when the entailment is perpetual, should be permitted in one class of cases and not in others?

Let us consider the right which a man can acquire in land. Is it an absolute, unqualified property in and control over it? Or is it, rather, the right to use it during his life? If the latter, (and I have the honor to suggest that it is,) some of the pro-

visions of our law of testament are as false in principle as the laws of entail and primogeniture. But if the first inquiry indicates the nature of property in land, then the living men of any generation have the moral right to declare who shall use the land assigned by political or natural considerations to the various states of the world, and also to announce, by a perpetual decree, to whom or what the profits shall inure. This doctrine, without limitation, can no where be defended. It will be observed that I am not speaking of the transmission of property from parent to child; this is the natural and just policy of the law, not the will of the original proprietor living and acting after his death. The inquiry I submit, then, by way of suggestion, is this: Ought the use and income of land to be determined within certain limitations, for a term of years, or without time, by the will of the present occupant, he not being the state nor immortal, or by a general rule of public policy which shall permit each generation, without revolution or violence, to use the land, and the income of the land in the way it thinks fit? The law, I submit, makes a distinction which has no foundation in principle, when it allows a testator to bequeath property to a corporation for a specific purpose forever, and does not allow him to make a similar bequest to those who are bone of his bone, and flesh of his flesh.

But the distinction of the law may by some be defended upon grounds of public policy. And it is agreed that a requisition of public policy is a reason why an admitted principle should not be universally applied. The wisdom of our ancestors is not more marked in any thing than in the abolition of the rule of primogeniture; yet this rule has existed in many countries,—Judea, Sparta and Great Britain,—and its advocates would find something plausible now to say in its defence. We borrowed our rule of descent mainly from Rome, but the Roman rule has not everywhere been taken as wise public policy. Now, then, our law says that it is bad policy to allow the eldest son to inherit to the exclusion of his brethren. So we all say. But the rule of primogeniture was not established, and does not exist, without a reason. In feudal countries the law of primogeniture seems to have sprung naturally from the relations of society required by feudalism. But these relations do not fur-

nish a reason pertinent to this discussion, and moreover, the rule has existed where this reason was wanting. But what more natural, even at a period anterior to the Middle Ages in Europe, than that the law should secure to each family a home? And is not this the enunciated theory of the reformers of this day? And in a country unequal in extent to a large and increasing population, what so natural and reasonable as that each family should be represented by one of its own members, who, in a patriarchal sense, should hold the estate in trust for the benefit of the whole line and name? And if one was to be selected, who so proper as the eldest son? And at this day, so does this reason live in the hearts of men, the public opinion of Great Britain outlaws from social life the inheritor of titles and estates who neglects the claims of his family and kindred. Here, then, is a reason, not a satisfactory, but a plausible reason, for the rule of primogeniture.

Now, gentlemen, can as good a reason be offered in defence of the policy of America which allows a corporation to take land and use the income forever, subject only to the will of a donor or testator who long since ceased to have an interest in the affairs of men? I confess I think not. It is claimed that these donations, bequests and foundations are usually for charitable purposes. Granted. But the charity which the law of primogeniture contemplates falls upon one's own household, and can there be any more sacred charity than that? And while you will not allow the man of to-day to furnish a home, clothing and education, to his own descendants forever, why should you permit him, to feed, clothe and educate the children of other men? It is the right of each generation to use the bounties and blessings of nature and of God, whether they be of the ocean or of the land, of houses, of goods, or of gold, so as to reach the end which the civilization of that age seeks; and it is the corresponding duty of each generation to use its wealth, whether it be of mind or of matter, for the greatest good of the greatest number. And leaving, for a moment, the laws and traditions of men, let us learn a lesson of faith from nature and our profession.

As the proper cultivation of the soil by one proprietor enriches and blesses every subsequent owner, so the right use of

whatsoever we possess will enable us to transmit wealth to the coming generations, where we have inherited only poverty, from those that are gone. I speak nothing against charity, nothing against education, nothing—surely nothing—against religion, but I think that the wisdom of a living generation, applied to its own affairs, is preferable to the wisdom of a dead generation. Now the law of primogeniture, and the law which permits the accumulation of mortmain estates for eleemosynary purposes, had their origin both in fear. Fear in the one case, that families, or members of familes, might be unable to provide for themselves; and fear in the other case, that future generations may not make proper provision for charity and education. If this fear in the latter case is well founded, the remedy will be ineffectual; for a people thus lost to the duties of charity and education, cannot be trusted to apply funds, however obtained. On the other hand, if a people are intelligently alive to these subjects, funds thus vested will be unnecessary, for their available means would always be equal to their wants.

But more than this. Special evils take deep and vigorous root in general wrongs, and many estates in England, and some in this country, are so hampered with restrictions laid on them by men who could not see the future, that they give but little aid to the causes they were intended to promote. To be sure, when it is no longer possible to apply the funds according to the will of the donor or testator, the law comes in and furnishes relief; but this power is very much like the power of impeachment as a remedy for a bad system of government. The remedy is resorted to only in aggravated cases, while the great mass of the evil remains untouched.

It is not supposed that the amount of mortmain estates will affect the public welfare at present—perhaps never. But of this, we cannot be certain. As land increases in value and becomes more desirable as a subject of investment, the managers of these estates are likely to become purchasers of the soil.

But there are two other causes at work, in aid of the evil of which we speak. One is the desire to do good, the other is the desire to be immortal. Of the desire to do good, we speak with respect. Persons who have been fortunate in pecuniary

matters, feel that they are almoners of the bounty, and often proceed to appropriate it to charity, education, or religion, as though nobody else had a right to be consulted. Sometimes it happens that the desire to do good and the passion for immortality are blended together, and institutions are established—as the Girard College, for example—which do violence to the religious sentiments of one age, and may shock the civilization and religion of all succeeding times. A majority of men do not act wisely, when they will what they themselves can no longer use; and their contributions to the cause of humanity would be greater, if they left their estates to the operation of the rule of law, in the belief that a just portion would find its way to the poor, the ignorant and the unfortunate. Other men, it is feared, lead a life of economy—sometimes of parsimony—that at death they may found an institution or contribute to a charity whose record shall make them immortal. For the cause of humanity, let the number of these be few, but it may be considerable. And if among us all there is a man who disregards the common obligations of life, who has no neighborhood, no social, no domestic, no religious relations or ties, which draw him from the mad pursuit of wealth, and whose summit of ambition is to transmit his poor name to posterity, may he cease to be an object of respect either living or dead. If in centuries, as the result of a noble love of good, or a low passion for immortality, or the union of both, a considerable portion of our soil should become inalienable in the hands of corporations, it would be an occasion of complaint, a source of suffering, a cause of decay. If we view our State as destined to live for centuries—if not, indeed, as we trust, immortal—it is essential to agricultural success, to the purity and perfection of social life, that every obstacle to the alienation of estates, and their free transmission from one hand to another, should be removed.

SCIENCE IN AGRICULTURE.

From an Address before the Worcester West Society, September 30, 1853.

BY PROFESSOR WILLIAM C. FOWLER.

In agriculture, as in manufactures and commerce, science, united with practical skill, and common sense and energy of character, is necessary in order to give the most successful direction to labor and capital.

Mr. President, and gentlemen of the Society—Do you not, upon the bare statement of this proposition, assent to its truth? We are told, upon high authority, that the knowledge and power of man are coincident; that while ignorant of causes he can produce no effects; that he can conquer nature only by submission to her laws; that what in speculation stands for the cause, or rather the principle, is what in practice stands for the rule. Upon these axioms rests the proposition. And if any one ventures the denial of this proposition, let him take upon himself the burden of proving that knowledge is not power over nature in agriculture, while it is in every thing else.

But, leaving this general statement, let us come home to men's business and bosoms, in a brief analysis of the proposition. Here is a young man with a strong arm, a clear head, and a stout heart, eager to enter into a partnership with nature, in order, by her aid, to obtain certain agricultural products. For this purpose he wishes to select a portion of the earth's surface on which he can labor. But it is not every part of the earth's surface that will make a good farm. There is a great variety of soil in the primary, the secondary, the tertiary, the diluvial, and the alluvial formations on the crust of our globe, as revealed by geological research. Now, unless he understands the nature of these formations, and the nature of the soil connected with them, will he not, before he makes his selection, find it for his advantage to study the science of geology in its practical bearing upon agriculture?

From his farm, judiciously selected, he wishes to raise certain vegetable products, as wheat, or Indian corn, which, with the least outlay of capital and labor, will yield the largest returns

of profit. Now this can be done only by bringing into operation certain laws of vegetable physiology established by nature, which take the necessary elements from the soil, from the air, from the water, and put them into organic vegetable forms. Now unless he is sure that he understands these laws, will he not find it for his advantage to study the science of botany in its relations to agriculture?

From these vegetable products, he wishes to obtain certain animal products, whether cattle or swine. To this end he must apply certain laws of animal physiology, established by nature, by means of which, elements in vegetable forms may, by the process of digestion and assimilation, enter into the composition of animal forms. Now unless he is sure that he thoroughly understands these laws in their application, would he not find it for his advantage to study the science of zoology in its practical bearings on agriculture?

The products of the soil depend, for their amount and quality, upon the use of manures, whether vegetable, animal, or saline, to supply those elements in which the soil is deficient. It is not every kind of manure that will suit every variety of soil; but only that kind of manure will suit a given soil, which contains those elements in which the soil is deficient. Evidently, then, in order to manure land judiciously, the composition, both of the soil and of the manure, must be known. In order to this, the laws of analysis and of synthesis, or of decomposition and composition, must be employed. Now, unless the young cultivator thoroughly understands these laws, in reference to the soil itself and the manure to be used, would it not be for his advantage to study the science of chemistry in its application to agriculture?

The products of the soil depend, for their amount and quality, on certain appliances of tools and instruments of husbandry. But the value and efficiency of these tools and instruments, as the plough, for instance, must depend on their conformity to certain laws of mechanical philosophy. Now unless he is sure that he understands these laws in reference to these tools, would it not be for his advantage to study mechanical science in its application to agriculture?

The products of the soil depend, for their amount and quality,

upon certain laws connected with the agencies of nature, like heat, light, electricity, frost. Now unless he is sure that he understands these laws, would he not find it for his advantage to study the science of meteorology, and natural science in general, in their relations to agriculture?

Or, to sum up the whole in a few words, does not intelligence, knowledge, science, pertaining to agriculture, qualify a man to become a better farmer, just as the knowledge pertaining to his profession, qualifies him who has it to be a better manufacturer or a better merchant?

Mr. President—What has made Massachusetts what she is in wealth, in physical conveniences and home comforts, in spite of the physical disabilities of a sterile soil and inclement skies? To borrow our illustration from what many here are familiar with, how does it happen that the members of the legislature whose homes are as far distant as Worcester, can every night enjoy their domestic comforts, and yet every morning, going at railroad speed, be punctually present in their seats, ready to attend to the first business of the house? To what is it owing, that in some emergency of business, of joy, or of grief, that they can receive or transmit intelligence, sent along the telegraphic wires with the speed of lightning? To what is it owing, that for a trifling expense, they can, by means of the Daguerreotype process, obtain portraits of themselves and their families, faithfully drawn by the unerring finger of light—"offspring of God first-born?" To what is it owing, that instead of drinking water, brackish, polluted, it may be, by sewers, or by other sources of impurity, they can drink the pure Cochituate water, and feel themselves stronger under its influence, than "a giant refreshed by wine?" To what is it owing that instead of lamps and candles, yielding a flickering and uncertain light, just sufficient to make the darkness visible, requiring frequent snuffing to remove a fungus or a thief, giving forth the odor and the drippings of whale oil and tallow, they can enjoy the clear shining light of gas, rivalling the sun in its power to turn night into day? To what is it owing, that instead of linsey-woolsey, home-made woollen, and brown tow cloth, and streaked linen, the princely manufacturers, vying in the beauty of their fabrics with the merchant princes, who can make their selection from

every part of the world, are able to furnish manufactured products at so low a price that they can array their families in a glory beyond that of Solomon, though, like "the lillies of the field, they toil not, neither do they spin."

To what are all these and other improvements which adorn and bless life, owing? They are owing to the application of science, in conformity with the laws of nature, to the productions of art.

And is agriculture doomed to be stationary, while the other arts, with exulting step, are marching in triumph towards perfection? Is agriculture, the eldest child of nature, and in closest connection with her mother, having fed her sister arts, to be dismissed dowerless, while they are enriched with the gifts of science?

But if we look at this subject a little more in detail, we can more distinctly see the connection there is between the science of agriculture and the art of agriculture, and the dependence of the latter on the former.

Science informs us that a plant can take from the soil only the constituents which are in the soil. Now what constituents are in the soil in any given case science informs us, either from a consideration of the rocks, by the crumbling and decomposition of which it was originally formed, or by a chemical analysis, or by an analytical examination of the plants or trees which are spontaneously produced on it. Thus, a soil formed by the crumbling of a rock of quartz, does not contain much potash, because it is not in the rock. An analysis of the soil leads us to the same conclusion. So does the natural growth of vegetation on its surface; as for instance, that of pines, which when analyzed, is found to contain but little potash. The celebrated Liebig informed me, that he attaches great practical importance to the last of these three modes.

It likewise happens that by taking off a certain kind of crop for a succession of years, the potash which naturally exists in the soil becomes exhausted. Some fields in Virginia were cultivated a hundred years, it is said, in raising tobacco and wheat. In that time, it is asserted that twelve hundred pounds of potash, to the acre, were removed in leaves and stalks in the case of tobacco, and grain and straw in the case of wheat. The

consequence was, that much of this land had to lie unimproved in the state of old field, as it is there called, until the potash is restored by a further decomposition.

I have called your attention to a single constituent, namely, potash, because it is so well known. What is true of this, is likewise true of other ingredients of the soil which were originally imparted to some rocks in larger measure than to others, but which by continued cropping, are liable to be exhausted.

Here, then, we have certain great principles of the science of agriculture, in this brief statement, and you ask me what practical use can be made of these principles, or in other words, what rules can be deduced from them to be applied to the art of farming?

In reply, I would say, that from these principles we deduce rules for your guidance, like the following:—

1. Raise that kind of crop, the mineral ingredients of which are found in the original soil, as for instance, raise wheat on soil that originally contained potash and the phosphate of lime or magnesia.

2. When a soil has lost, by cultivation, the quality of fertility which it once had, let it lie fallow with the expectation that it will, by the decomposition of the fragments of rock in the soil, recover its fertility.

3. In a case like the last, you may plough deep in order to bring up to the air fresh portions of soil which have not thus been exhausted. Thus the edges of the dirt thrown out from a ditch, often show more fertility than the field generally.

4. When a field has lost its power of producing one kind of crop, try another kind which does not demand largely that particular element in the soil which is exhausted. Thus, a soil that has been exhausted by raising tobacco, may produce a large crop of beans, which does not require potash to be in the soil.

5. Or, to generalize the last rule, adopt a rotation of crops.

6. In your endeavors to recruit the soil, be careful to ascertain the particular ingredient in which it is deficient, and then supply that ingredient.

Thus far, I have called your attention to the original mineral

soil, as it was formed by the decomposition of the rocks, whether changed or not from its place by diluvial or alluvial action. I now proceed to speak of the modification which it has experienced from the decay of vegetable and animal substances on the surface, forming what is called mould.

Originally the earth had none of this mould on its surface. The first races of vegetables derived their nourishment from a purely mineral soil, from water, and the air. From this soil they obtained their potash, their silex, their magnesia, their lime, their phosphorous, their ammonia. From the water they obtained their hydrogen. From the air they derived their carbon, existing in a free state or connected with water. Thus they grew, and when they died and decayed, the elements which composed them were united to the mineral soil to afford nourishment for the next generation of vegetables. Animals, subsisting as they do directly or indirectly upon vegetables, take the elements which compose their bodies chiefly from their food, and, in their life and in their death, bestow these elements on the soil. In this way provision is made by the Creator for greatly enriching the earth.

The difference between the mould on the surface and the soil below is, that mould contains decayed vegetable and animal matter. The quality of this matter must depend on the quantity of the vegetable and animal substances of which it is formed. For instance, that which is formed by the decay of maple wood must differ from that which is formed by the decay of pine wood.

Now one other general fact, or law, or principle, discovered by science is, that in some soils, vegetable and animal substances, if buried so far below the surface that the air does not get access to them, remain organic, and they are not converted into a form in which they can nourish plants.

Another general principle or fact discovered by science, is that decayed animal and vegetable matter in the soil, is nearly insoluble in cold water, and, therefore, is not carried off by the rain, and does not sink into the earth.

Still another general principle or fact discovered by science is, that this decayed animal and vegetable matter is liable to be

exhausted by crops and requires to be replenished by returning to the soil the ingredients which may have been removed.

You ask what use can be made of these principles discovered by science? In reply, I would say, that they are the foundation of rules like the following:—

1. If there are undecomposed vegetable or animal substances in the soil, expose them sufficiently to the air by ploughing or otherwise; or

2. Mix with the soil alkalies or manures that will hasten the decay of these subtances, in order that they may be reduced to that form of matter which will nourish vegetation.

3. Stir the mould as frequently as possible while the crop is growing, in order that the air may come in contact with decayed vegetable and animal matter for the production of carbonic acid to nourish the plants.

4. Adapt the manure which you put upon the soil to the particular kind of crop which you intend to raise. Thus a few pounds of bone manure might, in a given case, by furnishing phosphate of lime, be of more service for a crop of wheat, than any quantity of other manure which does not contain that ingredient.

5. When you find that a particular kind of manure has lost the power which it once had in recruiting the soil, do not attempt to make up in quantity what it has lost in power, but rather try some other kind of manure.

6. In forming beds of manure, bring together substances that are so related to each other that their chemical constituents will, in union, form the appropriate food for the particular crop which you wish to raise.

But besides the study of the original soil, and of mould on the surface, it is of great importance to the young farmer to study the laws of the plants which he raises, as they are developed in the science of vegetable physiology.

The great object of agriculture is to produce, in the most advantageous way, certain qualities, or a maximum size of certain organs or parts of particular plants. Now this object can be obtained only by supplying the condition necessary to their production. In wheat, we want the greatest size, number and excellence of the seed; in the potato, of the root. We cultivate

the rose for the flower, the oak for the stem, the apple for the envelop of the seed, flax for the bark, the mulberry for the leaf.

Now in these several cases, it is evident that the modes of cultivation must differ so as to correspond with the several products sought for. Thus the mode of cultivation employed for the purpose of procuring fine, pliable straw of wheat for Leghorn bonnets, must differ very much from that which is adopted in order to produce a maximum of grain of the same plant. Independently of other conditions, the food has great influence on the products generated by a plant. Charcoal powder, when given as food to a goose, produces an excessive enlargement of the liver. Vegetable mould, largely supplied to potatoes when growing, produces an abundance of starch, and makes them mealy. Strong animal manure, on the other hand, diminishes the quantity of starch, and makes them soapy. A large supply of water applied to rice, when growing, makes the berry firm for hulling; a diminished supply makes it brittle.

It is another general fact or law in the vegetable kingdom, that like produces like, there being, however, a gradual improvement or a gradual degeneracy, according to the conditions attending the cultivation. There are indeed occasional exceptions to this law of descent, when varieties are produced, whose characteristics also descend in obedience to the general law.

Another general fact or law in vegetable physiology, established by science, is, that if the pollen of the flower of any species be introduced into a flower of the same species, but of a different variety, the seeds from this flower will give a plant of a different variety still, that is, of a third variety.

There is another general fact or principle established by science, that plants can be acclimated, namely, taught to flourish and bear fruit in climates north or south of their original habitation. Thus, Indian corn, and the potato, by being cultivated north of their original homes have been improved, the one in the seed, and the other in the root, though the growth of the stalk may be somewhat impaired.

Do you ask what use can be made of these laws or principles, established by science in vegetable physiology, as the

foundation of rules in practical agriculture? In reply I would say:—

1. Seek with great care for seed of the best varieties of plants, with the expectation that the qualities of the plant will descend.

2. Take great care in selecting and preserving the seed from your own crops. In this way one of my acquaintances, in the course of twenty-five years, doubled the size of his Tuscarora corn. In this way, Baden in Maryland, obtained his celebrated corn, on one stalk of which I once saw ten ears. This improvement was accomplished in twenty years by selecting his seed annually from those stalks which bore the greatest number of ears.

3. When you wish to unite the excellencies of different varieties, as size and productiveness, place them near each other, that through the pollen of one flower and the stigma of another flower, they may be influenced to form new varieties. Thus Prince, at Flushing, brought the Spanish chestnut near the chinkapin of our own country, that the pollen of the one might fall into the flower of the other, and thus he obtained a new variety, which had nearly the size of the one and the productiveness of the other.

4. When you wish to cultivate a plant whose home is in a southern climate, do not be discouraged because you find a difficulty in bringing it to perfection in our shorter summers. By perseverance you can hasten the period of maturity. Thus one of my acquaintance, by care, continued through thirty years, hastened the ripening of the Lima bean full two weeks.

SOIL ANALYSIS.

From an Address before the Hampshire, Franklin and Hampden Society, Oct. 12th, 1853.

BY WILLIAM S. KING.

We are all agreed that farming ought to pay, whether it does or not; and further, that it may be made to pay. The question now is, how it may be made to pay? I answer: By raising maximum crops, at the minimum of cost to the owner and to his soil.

The agricultural statistics of Rhode Island, (which State, as I have remarked, is the only one whose agricultural statistics are complete and reliable,) show that the largest yield of carrots in the State, in the year 1850, (a bad year for root crops, by the way, because of the drought,) was one thousand bushels to the acre; while the average yield was four hundred bushels, and the least, amounted to seventy-five bushels, all told. Of onions, the largest crop was six hundred bushels; the average, four hundred; and the smallest, one hundred bushels, to the acre. Of Indian corn, the largest yield per acre was one hundred bushels; the average, thirty and a half bushels; and the least, six. Of rye, the largest crop grown on an acre was forty bushels; the average was twelve and three-quarters; and the smallest was—what think ye?—just three bushels!

Now, gentlemen, though we can easily see that it will well pay to gather these maximum crops, if economically produced, we can scarcely believe that they more than make the two ends of the year meet, who raise but the average; while how the wolf is kept from the door of those who persist in getting such crops as six bushels of corn, or three bushels of rye, passes our comprehension. Three bushels of rye! Six bushels of corn! Why, they will scarce suffice to feed the mice, that "most do congregate" in the granaries of such thriftless farmers.

We are, of course, aware that all soils are not able to grow one hundred bushels of corn to the acre, and other crops in proportion. But they are very poor specimens of land that will not, with good tillage, yield more than the averages above stated. Indeed, so far is it, in most instances, from being the

fault of the land, that I feel safe in asserting that, on an exchange of farms, the three-bushel farmer would, in a majority of cases, bring the land whereon was raised the forty bushels of rye, down to the average, in about the same time that the forty bushel farmer would require to raise his bad bargain up to the average.

In order to grow maximum crops economically, many things are necessary to be known, and many things to be done. I shall take up these requirements, and do to each what justice the limits of my time and your patience will permit.

In entering on a farm, the first things that a judicious farmer ought to ascertain are: the component parts of his soil and subsoil, and of the crops that he proposes to raise. These last may be learned from books; but the other items of knowledge must be obtained from an analysis of the soil; and it would be folly, as well as rank cowardice to deny, that the importance—nay, the very value in the smallest degree—of soil analysis is a matter now seriously questioned by some able men; as it is also ignorantly ridiculed by many simple ones.

That such knowledge is valuable and necessary, stands to reason. For plants, like men, to grow, to live, must feed; and this sustenance must come from the earth, or from the air, or from both. What nourishment the air contributes is very generally agreed upon; and, the earth supplying the rest, it becomes a matter of no little interest and importance to ascertain the state of the larder. If chemistry, through an analysis of soil, is not competent to this, we can not, otherwise, learn it.

Again, soils oftentimes contain noxious ingredients that impede the growth, or even affect the life of plants. These, when ascertained, may be neutralized and made harmless; or, as frequently happens, be rendered, in some other combinations, positively beneficial to vegetation.

The opposition of so many farmers to the application of chemistry—a science capable of doing them so much good and no harm—has ever been to me a matter of surprise. Let us now consider the objections.

The first objection raised against the value of soil analysis is: That in so great a quantity, as is the soil, comparatively, it is impossible to discover atoms so small as are many of the con-

stituents, whose presence or absence would cause it to be productive or sterile, as the case might be. In other, and plainer words, because it appears improbable, it is called impossible.

This is a singular argument to use in this age of the world, when every day exhibits its miracle; and the fingers of Clio, the Muse of History, ache with recording the triumphs of Science! When Jenner announced that Vaccination was a preservative against smallpox, the entire medical nose of Europe was upturned in derision. Wise men said it was puerile to expect so great a result from so inadequate and unphilosophical a cause. Pious men rolled up the whites of their eyes, and pronounced it sin, to set up the teat of a peaceful cow as a protection from the scourge of God. Conservative men called it "a new doctrine;" and, with this unanswerable argument, set it away among humbugs. A woman—to the honor of the sex be it declared—(the Lady Mary Wortley Montague) thought it could be tried; and who, now, denies what the wise men, and the pious men, and the conservative men of the last century declared to be impossible?

You cannot, for instance, (say the opponents of soil analysis,) find, and properly estimate the lime where it exists, as is often the case, in the proportion of thirty pounds of lime, to two million pounds of soil on an acre. This statement of the case would appear more startling to me, who am more of an annalist than an analyzer, were the former feats of science unknown to me. But when I know that the eyes of science have seen a star, so distant from our globe that its light, jogging along at the gentle pace of two hundred thousand miles in a second, consumes more than three thousand years in coming from home, hither; when I know how far sighted she is, I am prepared to believe that she may be gifted with a nicety of touch, to finger, weigh and appreciate any atom, however small. When science can read the decrees of God, before they are promulgated, (as when foretelling eclipses and the approach of the erratic comet,) it is not overtasking credulity to declare, that she can discover the component parts of a piece of dirt, taken in the hand to be examined at leisure.

But we are told, with an air of ill-concealed triumph, that men eminent for their scientific acquirements, have pronounced

the analysis of the soil, in the present state of chemical science, to be of little or no practical value to the farmer. Well, men sometimes ascend the hill of science to such a height, that they do not see objects palpable to others, who stand below the mist-clouds that always envelop its summit. Thus Dr. Dionysius Lardner had proved, to his own private satisfaction, and that of his school, the impossibility of navigating the Atlantic with steam, when he was roused from his reverie by the signal guns of the "Sirius," as, unimpeded by the conclusions of the philosopher, she sailed into the bay of New York.

Then, again, scientific men of equal eminence have declared it to be an invaluable and an indispensable aid to the farmer; and "who shall decide when doctors disagree?" When men of high scientific attainments and unimpeachable character assure us that an analysis of our soil, sufficiently accurate for all practical purposes, can be made, and is made, we are warranted in overlooking the denials of many others. Indeed, it appears to me, from a glance at the array of authorities on either side, that the opponents of soil analysis, are chiefly men of the closet; while its friends are, not only men of equal standing as chemists, but withal, practical agriculturists.

For my single self, I am not ashamed to believe with such men as Liebig, Boussingault, Johnston and others, in Europe; and with Charles T. Jackson, Norton, Mapes, Enderlin, Porter, Horsford, and many more, in our own land.

The second objection urged against the value of an analysis of your soil, is, that the quality of the soil on different parts of the same farm, and often on the same field, greatly varies.

This, at first sight, seems plausible; but we know that the chief variation is in the proportionate quantities of sand, clay, &c., and it is not with these, that the analyst has chiefly to do. Allowing alumina (clay) and silex (sand) to constitute ninety per cent. of any soil, in any proportion; it is rather with the remaining ten per cent. that the chemist deals. And the soil of a farm that has been in the same hands for a course of years—every field subjected, as is usual, to the same treatment in rotation—will be found to be very similar, one field to another, in all respects other than a predominance of clay, or sand, or the like.

The "Scioto Valley lands," are often summoned as witnesses against the value of analysis. These soils are extremely fertile, and are apparently inexhaustible,—having yielded immense crops of corn for twenty years in succession; yet when analyzed, are found to be very similar in their constituents to comparatively sterile soils in Massachusetts;—the chief difference being the greater pulverulence of the Scioto soil, which is like to ashes for fineness of its particles.

Two neighbors—farmers—agreed to carry through the winter, as an experiment, a dozen head of cattle, each, on a given quantity of hay of similar quality. The one cut his hay fine, and fed out to his cattle regularly, as their wants required. These cattle thrived, and spring found them sleek and hearty. Farmer Two turned out his herd to supply themselves, as best they could, from a well-settled old hay-stack. The hungry beasts gnawed at the stack steadily;

> "They fell upon what'er was offered—like
> A priest, a shark, an alderman, a pike,"

at times getting their fill; and, at times, gaining new appetite from their exertions. These, also, survived the winter, but they were gaunt, hide-bound, and wretched.

Farmer Two, of course, found fault with *the hay;* but we opine that the difference lay in the mode of feeding. And so we say of Scioto Valley lands. The soil is pulverulent—the food is chopped up—and always ready in the best state for the demands of the crop; while in Massachusetts, the tender rootlet is forced to contend for its food; now with a rock, and with a little less hard-hearted lump of soil, that gives grudgingly, and only on compulsion.

We have now stated two—and those the most serious—of the objections taken to the value of soil analysis; and have given our "reasons for the faith that is in us," of its importance. To show its bearing upon farming operations would cumber this address, and consume more time than any of us would willingly now spare. Let it suffice, now, to say that—its value conceded—it becomes the prime counsellor of the farmer in his ploughing, and in his manuring; it tells whether or not, and in what way best, to disturb the subsoil; whether

its incorporation with the surface soil is desirable; what, if any, applications are needed to render innocuous, or even beneficial, deleterious substances that may exist in the soil. The constituents of the desired crop being ascertained, it enables us to decide what aliment will be required, and to discover whether or not the food is in the soil, and in sufficient quantities, and if not, to supply it.

AGRICULTURAL EXPERIMENTS.

From an Address before the Hampshire Society, Oct. 26, 1853.

BY REV. F. D. HUNTINGTON.

The main oversight of the recent efforts at improvement has been a too hasty generalization, and a deficiency in patient painstaking, accurate records of experiment. A few brilliant announcements have dazzled our eyes; sanguine lips have trumpeted abroad spurious maxims; and the golden age of great profits and easy times has been heard knocking at the doors. Following the explosion of this sophistry is apt to come a reaction of discouragement, as unreasonable as the flattery. What the interests of your profession seem to me to be imperatively demanding just now, therefore, will be two things: 1. The most rigid and thorough experiment, as to every detail and particular of every mode of tillage, enriching and renewing of lands, breeding of stock, and new implements, taking into account all the most minute and variable conditions, data and circumstances, attending that experiment: and 2. A faithful, exact, and systematized registration of every such experiment, including specific statements as to all the particulars alluded to. This is that second stage, following the era of general discovery, which agricultural improvement has next to pass through; a period of thorough experiment, and scrupulous registration. Till we have the tests and tables only thus to be furnished, we have no rational induction, and of course no development of principles that will give us a proper science. The more extensive and diversified these experiments on a given question are,

throughout the country, the sounder your basis for an induction. Then let these records, bearing the stamp of more precision than is common in county reports hitherto, duly and responsibly authenticated, be brought together and collated by competent hands,—and you have got a body not of theories but of facts,—facts that will justify a broad and impregnable generalization, fit to be published, and constituting a noble contribution to substantial science.

One prime difficulty that will attend these processes will be an inadequate sense of the liability to deception. If you would meet those enemies to real advancement from which the farmer has already suffered so much,—careless statements and half-established conclusions,—you must bring into the field exact weights and measures, exact observations of climate and weather, exact attention to every element that may influence the result. Such credulous rules of evidence as suffice for tea-table gossip, or stories of table-rappings, will not answer. There must be a search for disturbing causes, not on one side only, but on all sides. If the case is one pertaining to an out-door crop, like wheat, for instance, consider the variety of elements you have got to watch and include in your report. There is, first, the quality, species and pedigree of the seed sown; there is the time of sowing; there is not only the composition of the soil, but its mechanical preparation, its comminution by plough and harrow, its situation as regards exposure to the sun, latitude, springs of water, and the antecedent crops taken from it; then there is the whole subject of manures, as to ingredients, condition, amount, and mode and time of application; then the direct treatment of the crop on the ground; the cost of labor; then the subtle and fugitive meteorological changes; then the relation of the growth to diseases; still further, there is the harvesting threshing, and winnowing,—for it has lately been ascertained that wheat subjected to one of the new machines, though fair in appearance, loses somehow a portion of its germinating, or reproductive power; and finally, not only the measurement but the weight of the yield,—for, as you know, wheat of the same apparent plumpness ranges over a difference of five or ten pounds' weight to the bushel. Now, it is not till you have brought into your registration each of these twenty-three speci-

fications that you can be said to have furnished returns of this crop of wheat. There is not one of them, which a thoroughbred scientific manipulator, if the case were transferred to the laboratory, would not despise himself for leaving out.

The same necessity for thoroughness exists in all other branches of the business. When you take up a lump of premium butter, you have hold of what seems to be a very simple, home-made fact, and a very pleasant one. But this fact has an antecedent biography,—and before the oily cake has slipped through your fingers, or elsewhere, if you are a good farmer, and a good Yankee, you have at least a dozen questions to ask about it,—how the fact has come to be,—all the way from the cow and the cow's mother, and grandparents, on to the toast. You want a written natural history of this lump, *ab ovo usque ad malum.*

Nor is farming singular, in this respect, among the sciences. Look at the nicety of astronomical calculations. Look at the minute mixtures of the chemist. Look at the hair-balances, and tests of exquisite delicacy, in every philosophical apparatus. Observe the most awful precision exacted in clinical surgery. Furnish a Herschell's discoveries without the achromatic lens and infallible mountings of his telescope and siderial clock, with the horizontal and vertical adjustments of transit instruments, air-bubble and spider-lines; conceive of a Bergman's or Faraday's analyses, without atomic weights and unimpeachable tables and mathematical proportions, and you may expect a perfectly intelligent agriculture without this sharp inspection, and these unquestionable statistics. Why should you desire exemption from them? They are what invest your calling with its lasting interest,—its intellectual charm. They furnish the sort of fascination that is likely to pique and attract the curiosity of bright young men. I can even imagine a man's having his sleep broken, his pulse accelerated, and his nerves in tension, while he watches for the impending result of one of these elaborate and exciting experiments, like the issue of some well-matched game.

I have spoken of the need of these tentative processes. I appeal to your own experience. There are few of that more progressive class of farmers that form societies, and arrange

exhibitions, like this, who have not some time been victims of crude statements. Indeed, it is quite extraordinary how many of what are now the prominent subjects, most interesting and most discussed, relating to practical husbandry, remain from year to year open and undecided questions, with about as much said on one side as the other; when nothing is wanted but trials enough and attention enough to settle them peremptorily. In Massachusetts alone, there are farmers enough at work, if they would continue their observations, to determine any of them in two seasons. Make what allowance you will for that wide margin of uncertainty that always hangs about a business so dependent on seasons and weather, still, I say, Nature, reverentially and resolutely studied, never cheats her disciples. Find her laws, and, rely upon it, they never will miscarry. You have only to talk with your neighbors, or turn over the files of any agricultural journal, to find examples of what I refer to. What universal rules have been established, for instance, as to the mode of applying manures! Yet why should there not be rules, for all cases, as much as for the silversmith in mingling metals, or the apothecary drugs? Subsoiling has been preached for some five years past, both here and in England, as the Columbus discovery of modern tillage, revealing to every farmer a new territory underneath his cultivated one; you are pointed to Lord John Russell's turnips, and the Rackheath wheat. But does the practice actually apply as well to New England as Old? Is there an offset to its benefits in later crops and more exposure to frost? What are its relations to under-drainage? Does it relieve wet lands, or render them more hopelessly soaked and spongy? Is it equally good for a dry, friable soil on a sand-hill, as I have seen to be true in one case, or is it any better than the common deep ploughing as they practise it in Surrey and some parts of Yorkshire? Now what I affirm is, that each of these queries ought to have one, definite, indisputable, experimental answer, recorded where it can be got at; an answer put beyond the region of conjecture, and rooted in authenticated facts.

Again, of the application of lime, the preconceptions of chemical theory would seem to promise that it belongs only to non-calcareous soils; yet does not experience show instances

where a calcareous soil has been specially fertilized by carbonate of lime? And if so, what are the conditions that generate the anomalous result?

Again, within two months, I have seen in a single number of a popular agricultural periodical, two communications, both in a very positive tone, taking precisely opposite grounds on the question whether, in salting hay, the salt may be thrown on the top of the mow and left to inter-penetrate the mass, or must be cast into each separate forkful, or layer, as the hay is pitched from the cart.

Again, the Deerfield farmers, in this State, close by the celebrated residence of Henry Colman too, dispute one another to this day, as to the value of the "old tore," to a grass crop; some of them insisting that it helps the next yield, and others, that it is better to keep the sward close.

Or, once more, what is the right law of producing fertilizing agents? Must we continue the old fashion of spending the winter in feeding out all that we spend the summer in gathering in, copying the circle of the snake that swallows his tail, or is there some better way? And will more be gained by following the famous aphorism of the Earl of Leicester, "The more meat a ploughing farmer sends to Smithfield, the more corn he may sell at Mark Lane," or by raising young cattle?

Now what may be asserted of each of these mooted points is, not that every one of you may not have an opinion upon it, and be very sure he is right; but that his next door neighbor is likely to have an opposite opinion; whereas, both being reducible by experiment to fact, there ought to be, not opinions, but knowledge. The conditions of a given result ought to be as clearly determined as the oxidation in electro-magnetic machinery, combustion under a steam-engine, or the proportions of chlorine and hydrogen in thirty-seven pounds of muriatic acid. In looking over the reports of the several county societies for the last year, I see complaints on half the pages of non-compliance with the rules of the committees in reference to accurate returns. One reason, I suppose, is, that a farmer begins the season with no idea of competing, and therefore keeps no record; but unexpectedly finding Nature has favored him with a remarkable product, he takes it to the exhi-

bition, hoping his blunder will not forfeit his chance. This suggests whether it would not be well worth while, not only to withhold the premium on account of the omission, but to establish a separate prize for the best method and most accurate specimen, in reporting the whole internal history and transactions of the husbandry of the year.

To this end, that he may be his own professor, scholar, secretary, and reporter, let every farmer have as complete an apparatus as he can afford, for conducting his examinations, and nice admeasurements. Then let him enter his daily record, with special respect for arithmetic. Let him keep a running debt and credit account with every acre of his land, as much as with his blacksmith and grocer, and post his books. This will sharpen his wits, double his relish, and shed a steady intellectual irradiation through his whole employment.

STUDY OF SOILS.

From an Address before the Franklin Society, Oct. 7, 1853.

BY DR. DANIEL LEE.

Suppose I were to investigate a fair sample of the arated soil of this county, and compare it with the soil in western New York, which produces the largest crops grown in the United States, what, think you, would be the essential difference between the two? It may be presumptuous in me to hazard an opinion on so important a question on general principles, without a special examination of the land in this region. But you have the old red sand stone here precisely as it is found in the District of Columbia; you have soft water here as it is there; and your land here as it is there, is better adapted to corn than wheat. During the last six years I have had ample opportunities for the critical study of the freestone and granite soils of the South, as I had previously to investigate the limestone soils of Western New York.

When rain water passes through the latter, and appears in wells and springs, it is uniformly charged with salts of lime

and magnesia; and it rarely fails to contain salts of soda and potash in sensible quantities. Take a gallon of your well water and evaporate it to dryness, and it will not often yield more than a half grain of carbonate of lime; while a gallon of well water in Monroe County, on our best wheat soils, contains fifteen grains of carbonate of lime, and ten grains of the sulphate or gypsum. It also contains from five to ten grains of epsom salts, or sulphate of magnesia, several grains of common salt, particularly on the Onondaga Salt Group, which extend from Madison County through Onondaga, Cayuga, Wayne, Monroe, Orleans, Niagara, and some distance into Canada. It is the various salts which abound in the earths and rocks of Western New York, that impart to its soil unequalled agricultural capabilities; and yet I have analyzed more than a hundred samples of the richest farming lands in that region, and never found over two per cent. of lime in any soil. When you see 100 pounds of gypsum applied to an acre, add a ton of clover hay to a crop in a year, although this salt of lime applied as a fertilizer, adds only one part in 20,000 to the soil, estimated to the depth of only ten inches, you have demonstrated the great value of a little of "the salt of the earth," where it is really needed. In a like manner, the salts of ammonia, and phosphates of lime, soda, magnesia and potash, found in guano, demonstrate, in the most satisfactory manner, the extraordinary power of a very little food of plants in augmenting their growth upon poor land. Under favorable circumstances, 100 pounds of Peruvian guano add from 400 to 600 pounds of merchantable shelled corn to the crop. To understand how so little manure produces so large a result, we must bear in mind that in 100 pounds of the seeds of maize there are 97 pounds of carbon and the elements of water, and only 3 pounds of the constituents that impart peculiar value to guano.

It is not because wheat plants extract any considerable amount of lime from the soil that limestone lands are uniformly the best for this grain. A reasonable amount of the calcareous element enables stable manure to produce more than it would without any lime in the soil. This is a curious fact, but I am unable to state the minimum quantity of lime that will suffice for all useful purposes. I am confident that two per cent. is

the maximum quantity needed to grow wheat under the most favorable auspices; but whether one part in 100, or one in 500 or 1,000 will answer equally well I have never been able to satisfy myself. So far as my observations have extended, all farming lands that yield soft spring and well water need lime; and they very often lack other ingredients quite as much, which the application of lime will not supply.

In studying soils it is important to bear in mind that while common stable manure is rarely worth over a dollar a ton, good guano is worth fifty times that sum for the same weight. There are thousands of farmers who are now making three barrels of wheat, or five of corn from one of manure; and when the cream of the best soils shall become an article of commerce, as I hope it soon will, you may look for a revolution in New England agriculture. You can hasten a material change for the better by encouraging careful and reliable experiments in the feeding of all plants and animals grown in Massachusetts; or you may prevent such change by opposing the establishment of an experimental farm in the State. Beyond all question, tillage and husbandry embrace many experimental arts, and many experimental sciences; and I believe that it is just as easy in a long run, to draw the food of annual crops from ten to twenty feet below the surface of the ground, as from ten to twenty inches. The earthy matter that enriches your creek and river flats came from deep ravines, hillside-gullies and mountain-gorges, and not mostly from the surface of uplands. Clay washed from one hundred feet below the surface, and distributed as mud and sediment, over meadows and pastures, rarely fails to enrich them. Witnessing the good effects of such deposits, I am expecting to rejuvenate a farm that was worn out by tobacco culture before the Revolution, mainly by bringing the deep subsoil to the surface, and depositing it in gently flowing muddy water. On every square yard of our land there falls about a ton of water in twelve months. A few thousand tons of water falling on the tops of hills on one's farm are no mean mechanical power for spreading the most fertile substances which the farmer can command, over all the ground below. Agricultural mechanics and engineering are in their infancy; and I confess to you my anxiety to see them cultivated in New England,

where I am confident they may add four-fold to the intrinsic and marketable value of your farming lands. All the elements of fertility that make your best flats worth $200 or $300 an acre, exist in the atmosphere, in rain water, and in the earths of all uplands, hills and mountains. These abound more or less in agricultural salts such as I have briefly referred to in calling your attention to the most productive lands in the Union. While I doubt not you would find it profitable to purchase guano, lime, gypsum, ashes and bone dust, to a certain extent, yet were I farming here I should rely mainly on irrigation, and elements derived from the earth below the soil, and from the atmosphere. While endeavoring to accumulate the essential elements of crops in the soil as a permanent investment, capable of yielding a good interest, I should sell nothing but air off my farm in the shape of choice butter and the very little earthy matter in the bones and flesh of fat pigs and steers. If I were to burn an ounce or pound of pure butter before you, no ashes or incombustible part would remain. As butter, lard and tallow may be changed into vapor and gas, it is an important question in farm economy how one can best transform vapor and gas into butter, lard and tallow, by the wise use of poor land. How, think you, the atoms of starch in this potato were formed from carbon and water? Although starch, oil and sugar contain no earthy matter, yet to organize these substances something more than vegetable life, carbon, and water seems to be necessary.

Finding that half of the ash left on burning a potato, was pure potash, and that new ground, rich in leaf mould, is much better than old land, from which the soluble alkalies have been washed and leached, or removed in crops, for the production of this tuber, and plants rich in oil and sugar, I was induced to experiment, several years ago, on the value of potash in organizing starch, sugar, and oil. In the seeds of wheat, there are six times more of this alkali than of lime; and the same is true, I believe, of all oil-bearing seeds, and of the ash of plants that yield much sugar. How far soda may take the place of potash, or magnesia that of lime, in the economy of vegetables, is a matter to be decided by future researches. Soils comparatively rich in alkalies, produce the largest growth of forest

trees, particularly hickory, sugar-maple, elm, oak, and beech; and they often abound in grape vines.

The pot and pearl ashes, made from a ten or twenty acre clearing in Western New York, frequently sell for enough to pay the whole cost of felling the timber, cutting and burning it, and preparing the ground for a crop. I never saw any good land that was not rich in potash, and how to extract it from mountains, hills, and valleys, for agricultural purposes, is a problem to which I have devoted some attention. It must be done by water, and applied to land by irrigation. All the salts of the ocean are well known fertilizers dissolved in water; and if it were practicable to irrigate a farm with sea-water once a year, guano, which is derived from fish and the ocean, would never be needed.

Such irrigation would soon render the granitic soils of New England not unlike those of the Onondaga Salt Group of Western New York. At no very remote period sea-water will be evaporated in tropical climates to obtain immense quantities of compound salts required to impart fertility to islands and continents. Oysters and other shell-fish and corals find an inexhaustible supply of lime in the water of the ocean. Whether you study its minerals, its vegetables, or its animals, it is found to be a vast reservoir of manure.

Farmers should take enlarged and comprehensive views of their calling. The resources of nature are unlimited; and we have only to learn ways, and provide means for the wise use and successful application of those elements of power and wealth which everywhere surround us. Agricultural meteorology teaches us that under a temperature of 73° to 75° Fahr. solar heat will raise sixty-five thousand tons of water in a day from the surface of a lake two miles square. The mechanical power of this heat may be better appreciated, when I inform you that ten steam-engines of 200 horse-power each could barely raise that quantity of water between 300 and 400 feet in 24 hours. Heat radiated from the sun is the true source of all the water-power in the world; as it is also the true source of all the steam-power, whether generated by the combustion of coal, wood, or alcohol in a spirit lamp. The mechanical force developed in human muscles, and those of your horses

and oxen, has a similar origin. Farmers should study solar heat and sunshine. You have seen corn planted in cold wet ground, rot instead of growing in the spring. You have seen it grow feebly, turn pale and yellow, because the earth was cold; and you have seen other corn where the ground was warm, exhibit a deep green color, and grow rapidly. Now, what relation does the growth of this plant bear to the temperature of the soil? Until recently, vegetable physiologists believed, from their limited observations, that the increase of vegetable organization was in the ratio of the increase of temperature, under the circumstances named. But the recent researches of M. Quetelet, perpetual Secretary of the Academy of Science, Brussels, on the climate of Belgium, have shown that the increase of growth is as the square of the increase of temperature in the soil. If a corn plant adds three grains to its weight in 48 hours with the earth in which it grows 15° above freezing, it will add twelve grains to its weight in the same length of time, if the temperature of the soil be raised to 30° above freezing. These facts show you the great importance of investigating the temperature of soils. By allowing our agricultural plants to extend their roots into cold earth that needs under-draining, we diminish our crops of grain, English grasses, roots and fruits, one-half, and gain nothing. Water that drains from soils, and that which collects in low grounds and swamps, is valuable for irrigation. It sometimes contains acid salts, or vegetable acids injurious to crops; but by adding a little lime to such water before it is applied to grass land, these acids are corrected, and the calcareous water may be regarded as a weak solution of manure.

By draining and irrigation you may impart a degree of life and growth to vegetation not attainable in any other way. Where it is necessary, water must be lifted by pumps worked by horse-power or steam. Occasionally water-power may be had; and I have seen wind wheels drive pumps very successfully. Engineering has done much for agriculture by constructing canals and railways; but it is destined to do vastly more by the construction of valuable and lasting improvements on our farms. They are soon to be regarded as manufacturing establishments. We do not make crops, or pork, or beef, or

butter from nothing. A first rate cow gives 24 quarts of milk in as many hours; and in the production of this article, a pound, or a pint, is formed every thirty minutes from her blood. The living machinery by which her food is digested, taken up by vessels, and finally transformed into milk rich in butter, cheese and sugar, is not generally understood by farmers. If this machinery were properly studied, the six million cows now kept in the United States would soon be replaced by improved races that would yield an average of fifty per cent. more milk from the same quantity of food now consumed. The dairy cow which elaborates the most milk, butter and cheese from any given amount of grass, roots or grain, is the one that deserves the highest premium; not the cow which produces the most milk in a week or month, regardless of the quantity of food consumed. By awarding premiums on this principle, you wil soon learn the exact relations that subsist between a ton of green grass eaten by a first rate milker and the required pro duct in milk and butter. Few know how much good pork or beef 100 pounds of corn ought to produce. Before it is possible to put things together in the most skilful and profitable way, we must investigate the exact relations of these things to each other. In a word, farm economy is at once a collection of experimental arts and experimental sciences, which can only be advanced by wisely conducted and truthfully reported experiments.

FARM ACCOUNTS.

From an Address before the Berkshire Society.

BY JUSTUS TOWER, ESQ.

A very important consideration for the farmer, is, to be systematic and accurate in all his business transactions. We look upon the merchant, manufacturer, or mechanic, with distrust, who does not manage his business in a systematic manner. One of the secrets of success may be found in the counting-room, where the ledger reveals all the facts. Every article

that has been received into the mill is entered; the raw material, the labor, and every contingency, also every yard of cloth made and sent away; bills of sale entered. Within the leaves of that ledger are the facts which show whether prosperity or adversity are the fruits of their toil.

It is just as important for the farmer, although he may operate upon a smaller scale, yet this is no apology. Suppose the young farmer, (for our hopes are in him,) should enter upon a thorough system of keeping an exact account of every transaction upon the farm. First, the appraisal of all his stock and implements of husbandry, grain and vegetables on hand, every expense of every crop, the time of ploughing, and how deep, time of sowing, how much manure used on each piece, its value and how applied, when each piece was planted and the manner, when hoed, what fertilizer used, when cut up, when harvested, and the amount of products. Now the first good result will be in the commencement, from the fact that a correct record is to be made of all the transactions on the farm, and all that pertains to it. There will be more care; ground for ploughing will be assigned with more caution, manure used with better judgment, better ploughing and better tilling. There will be a sort of pride springing up which is a good stimulant for doing things well.

Now the result: the harvest is closed, the winter comes on, the threshing is done, the grain, the butter and cheese, the pork, beef, turkeys and chickens, and all the little departments are closed up, and the books are posted, the items all added together, of the expenses and the income, the appraisal of property on hand, and the result is shown. Besides all this, he has a record of every field of grain, the expense of every crop and what it has produced, per acre, and its value, and the income of his stock. The manner his compost has been made, and expense, the amount of repairs made, how much wall built, his experience in raising vegetables, and remarks about the fruit trees and fruit, and general remarks about the business of his profession. The sequel is, the young man is better prepared for the operations of the farm another year, than he has ever been. He has minute experience, he knows the most profitable crops to raise, he will fill up the omission, and avoid

the errors of the past, and there will will be improvement upon improvement, and the greatest improvement will be upon the man himself. Man is so constituted, that if he works with his mind, as well as with his hands, he will advance in knowledge.

AGRICULTURAL EDUCATION.

From an Address before the Housatonic Society, September 29, 1853.

BY HON. H. L. DAWES.

The Commonwealth encourages the multiplication of societies kindred to the one here assembled, and they are an essential element in the system of agricultural improvement. They perform an indispensable part in awakening an interest, kindling a love of emulation, a zeal in competition for prizes, which, in their reaction upon the farmer at home and in his fields, are sure incentives to improvement. But I think I may be pardoned by you for speaking out here my own conviction, that alone they never will accomplish the work so important, so indispensable—the one great duty of the day and the hour—*the regeneration of the soil of Massachusetts.* They may be powerful coadjutors, but they do not strike at the root. Their mission is to awaken, to arouse, to stimulate, but not to reveal principle, to unveil the hidden, to enlighten, to educate, or to strengthen. You may, and no doubt have awakened in all the farmers who yearly come up to this fair, a desire to enter into a generous competition in the improvement of their farms. But you have not taught one of them what ails the worn out, barren fields, whose weather-beaten surface mocks his zeal. You have not told him why the same acre will not bear corn through all the years of his life, nor why his manure seems thrown away on one part of his farm, and is comparatively worthless on another. In short, you have not told him what his farm is made of, nor of what are composed the crops he yearly reaps from it. Nor can he learn from you the chemical relation existing between the soil and the manure which he

applies to it. These he must learn elsewhere, for you cannot teach them to him. Now, unless he stumbles upon them by accident, of what practical avail is it to him that you awaken in him a desire ever so strong to excel his neighbor in the richness, the variety, or the quantity of the products of the soil? He must know what to do, or it matters little whether he care to do or not. True, it is better to care to do and not to know, than to know and not to care, for the solicitude may aid in the discovery. But otherwise man is only rendered dissatisfied with his condition without the means of making it better. These are some of the obstacles to be encountered by the farmer in the discharge of the grand, crowning duty of this day—the regeneration of the soil of Massachusetts. And the means, not now within his reach, that shall enable him to triumph over them in this great attainment, are the necessities of the farmers of this Commonwealth, of which I am to speak.

These means lie in an agricultural education. And for their accomplishment let Massachusetts establish an agricultural school where will be taught the principles of the science, and their application to the art of agriculture, and let the doors of knowledge be opened wide to all the sons of her soil—not for the study of the speculative and mysterious, but the practical and useful. It may not be for us as yet, to know the process by which the fruits of the earth attain their growth. We behold the spire of grass putting forth beneath the genial influences of the sun and rain, but the mysterious agencies which lift it from the seed to the full grown blade are, as yet, too subtle and profound for finite ken. The trees in spring time put on their foliage like a garment, but the tiny shuttle that weaves the texture of the leaf plies its thread unseen. The lilies of the field are arrayed in a glory surpassing that of Solomon, but the pencil which traces their gorgeous hues moves without hands, and is seen only by the great Artist above, whose thoughts are not as our thoughts, and whose ways are past finding out.

But though it may not be permitted us to comprehend the process by which the elementary substances of the earth are transformed into the fruits we reap and garner up in barns, yet we may know what those substances are, and where they exist.

It is one of the primary objects of an agricultural education, to reveal these truths to the tiller of the soil. Without that knowledge he cannot successfully prosecute his calling. That knowledge he can attain. The principles of agricultural science are the combined result of all experience in husbandry, and all deductions from all other sciences upon this subject. Many of those principles are not yet fully developed. Where but in the school, with competent instruction, can the tiller of the soil become master of those principles which *are* known, or be led successfully to explore the arcana of nature in search of the unknown.

The farmers of Massachusetts have not always shown an alacrity in embracing all professed improvements in the culture of their farms. Many of them, as in every thing else, are but professions, while some are of real intrinsic worth. But the farmer hears of them by accident, or through the questionable source of some interested patentee. He has seen the failure of so many experiments. He knows nothing of the principles of their application, whether they should succeed or fail, he would be alike ignorant of the cause of success or failure, and he, therefore, either foregoes their application altogether, or blindly tries, and as blindly fails, and then turns away in disgust from all new notions to the old track his fathers trod before him.

If, on the other hand, all these professed improvements could be submitted to the test of scientific experiment, upon a farm owned by the State, and connected with an institution for the education of farmers; if their principles could there be developed and taught by practical demonstration to the sons of the owners of the soil, then what proved worthless would be thrown aside without a useless expenditure of time and money by the practical farmer, and without engendering that disgust of all innovations which is so prone to follow a failure to realize promised results. And whatever time and trial have tested and shown valuable, would be brought home to immediate practical application under the auspices of enlightened, educated mind. The result of experiments thus conducted cannot be doubtful. Theory is thereby reduced to practice, and the rules which abstract science teaches are thus demonstrated and illus-

trated. No fanciful projects of farmers in buckram, no impracticable plans of kid-gloved gentlemen would then ever vex and disgust farmers in frocks.

It is in the light of such an institution, erected and liberally endowed by the State, with the aid of private benefactions, for they should go hand in hand, that the farmer, awakened from the pacified sleep, in which he and his neighbors and their fathers before them have rested, would walk and store his mind with the rich fruits of the experience of all times and ages, and with the lessons which all science would teach. It is here he would trace effect back to cause, sift out error, detect the false from the true, and arm himself in full panoply of experience and skill against the most inveterate prejudice and unyielding obstacles that ever beset the path of the farmer.

At such an institution, if properly endowed, there would be found specimens of all the different kinds of soil which prevail in Massachusetts. And the student of agriculture could there submit his own farm to the crucible of science, and study its qualities in the laboratory or the lecture-room, analyzing it by the help of chemical agents and experimenting on it by the application of those properties found deficient, or neutralizing those which exist to excess. In fine, spreading out his own acres like a book before him, and studying them as a difficult problem, of which experimental knowledge and scientific deduction furnish the solution. Let the young man destined to the hitherto neglected, but honorable calling, of the tiller of the soil, be *educated* for his, as men are educated for the other professions; his mind schooled and disciplined, let him start in the world with the help of other men's experience and study, just as a man would commence the practice of law, or of the medical profession, and success surely awaits industry and enterprise.

It is to this end that I urge here the importance of the establishment of a State institution for instruction in agriculture. It should be the property of the State, for the fruits of its success would be the enhancement of the wealth, the elevation and independence of the yeomanry, the improvement of the social and moral condition of the whole people of the Commonwealth. No private liberality could open such an

institution to all the tillers of the soil, yet to it should be drawn those of all classes and conditions. And they should there find all the allurements and attractions with which science can invest this, the noblest of all arts. Let the young man be here imbued with the wisdom of all experience in agriculture, with all that science has as yet revealed of the constitution and capacities of the earth he is to till; let him be quickened to push still further his researches and experiments into unexplored regions, and bring back some new fruits for practical application, and he will come back to the every day realities of practical life a new man, equal to every emergency, and competent for any undertaking.

For one moment picture to yourselves that entire generation of young men in this Commonwealth, who are just now entering upon the active duties and responsibilities of life, coming forth from such an institution, educated as I have described, cultivated in mind and in all habits of industry and frugality, quickened with a love of knowledge, and pervaded with a zeal that shall beget improvement—and what, let me ask, may we not hope at their hands? How, under such a generation of farmers, would the surface of the earth clothe itself anew as with a garment! How would the waste places bud and blossom, and bear fruit! The barren fields would wake into newness of life. The flocks would, in very truth, be led into green pastures, and the herds by the still waters. Fruit and ornamental trees would cover the nakedness of our hill-sides, and comfort and competence would bask in the sunshine of a golden age. Herein is our hope. On such a day does expectation wait. No man can draw a fancy picture of the result. I believe I shall have your assent, that could one whole generation be thus educated, no sketch of mine could portray in too high a coloring the result of their labors. The imagination would fall limping behind the reality in such a march of improvement.

I cannot presume upon your time or patience long enough to enter at all into the details of such an undertaking. I can only attempt to gather the thoughts, the aspirations, and hopes of the farmers who may hear me, upon some object kindred to this. When that is done throughout the State, then will be overcome the greatest obstacle now in our path—the reluctance

of the Commonwealth to embark in such an enterprise, and expend her capital and devote her energies to such a purpose. No one doubts the ability of Massachusetts, if she choose to endow an institution for the education of her sons in agriculture, that shall as far exceed, in all that gives life and efficacy and practical value, theprincely institution of Cirencester, in England, or the more renowned and more useful Hofwyl School of Fellenburg, in Switzerland, as English enterprise is wont to exceed ours in the magnificent scale on which it is always projected, and in the sluggish pace at which it usually moves; or as that of Switzerland may surpass ours in the high toned and transcendental schemes which pervade her every undertaking. To all this Massachusetts is abundantly able. But she will not enter into it readily. She will consider, contemplate, and more than that, like her Yankee children, she will *calculate* and *reckon* some time, before she will embark in this undertaking with a soul that shall make success certain. All this is well. No more important undertaking can enlist the energies of this Commonwealth, and she will do well to count all the cost. She has done much, it is true—no State has done more—to add lustre and real glory to the American name. Her public works, her public charities, her seminaries of learning, her institutions for the reform of the erring, and the punishment of the incorrigible —all bear testimony at once to her noble heart and liberal hand. Eyes has she been to the blind, ears to the deaf, and the dumb have learned to lisp her name and her charities in the same breath. Her munificence has lifted to the light of reason the veil that darkens the desolate mind of the lost and wandering lunatic; and at her table have fed, till they no longer hungered, the beggared outcasts of the old world. But there is still other great and noble work for her to perform. There is yet another high duty to her own sons, she must sooner or later discharge. Home and household are not to be forgotten in yielding to the behests of an universal charity. When she not only sees, but feels, that amidst all her munificence lavished upon the objects of desert or of favor around her, that her own soil is growing poorer and poorer every year—while those who consume her products are daily multiplying on her hands, she

will then turn herself to the consideration of this subject with an intensity commensurate with its importance. She will behold with pain the best blood of her sons turning their backs upon the homes of their youth and the good old Commonwealth of their love and their pride, and their faces to the rich prairies and abundant harvest of the teeming West. And though, like a fond mother, she may boast that it is the enterprise and indomitable will of her sons that have written themselves far above competition in every distant field, yet this exultant pride cannot but be saddened by the consciousness that all these achievements of her sons abroad must be at the expense of her own household at home; that the old patrimonial estate of Massachusetts Bay and Plymouth Colony is in danger of losing its attractions for the sons of the Pilgrims, and that the youthful energies and expanding resources of other States are drawing away to their full bosoms that strong, that irrepressible, irresistible Yankee character to which

"None but itself can be its parallel!"—

and which if it could find room at home for its expansion, and material on which to expend its superabundant life, would make its mother State the rival of the world.

When, I say, Massachusetts not only sees but feels all this, then will she, in self-defence, turn her thoughts to the remedy. And then will you behold the walls of such an institution as I have delineated, beginning to rise—not rapidly like a gourd in the night—but slowly, and from deep and permanent foundations. It is but a question of time. Sooner or later that day will come, to gladden the hearts and gild the dawning hopes of the farmers of this Commonwealth. The spirit which is being awakened throughout the State, of which such societies as this, with their annual exhibitions, are at once the evidence and the origin, is hastening on that day.

My only apprehension is that the languishing powers,—the recuperative energies of our soil and our enterprise,—may be suffered to sink below revival, and that the spirits of the sons of these hills may be condemned to the pressure of such burdens so long that they may lose that elasticity which, with free scope and room, ever bound into the full proportions and per-

feet statue of manhood. But fears of this kind fade away in the light of the manifestations around me, of that restless spirit of inquiry, dissatisfied with the present, apprehensive for the future,—seeking to avoid the declivity, and reaching up the ascent, for the attainment of what there is an inward consciousness of capacity to achieve, kindled in the breasts of the steady yeomanry all over the Commonwealth, bringing them up from their harvest fields brown with the summer's sun, and making profert of the stalwart arm and iron muscle which no toil can tire; coming up with the emblems and fruits of the sweat of their brow, to these festivals, here to rejoice in "the victories of peace more renowned than those of war." These omens are unmistakable. They augur a public sentiment which, ere long, will be resistless, and out of which will spring that action of the Commonwealth, which, sooner or later, self-respect and self-defence will compel her to take.

Fellow-citizens, I have attempted to picture to you but one view of that future which all the signs of the times unite in pronouncing so near at hand. I have but reminded you of the gain to your granaries and your treasures, which would flow in from every hill-side, and spring up in every vale under the benign influence of an enlightened and liberal education bestowed on every farmer. There are other views of this subject not less important, and which ought never to be omitted or made subordinate in the consideration of the measureless good with which it is fraught—views which, were not both my time and your patience exhausted, I should delight to present. Nevertheless, do not forget the moral and religious influences which would be shed over the land, by such a system of education. Ignorance and vice are hand-maids, but an enlightened education clothes a man or a body of men in a coat of mail, and becomes a shield and a rampart against the insidious approach of the tempter. Nor is this all. Such an education will open to the farmer the beauties, the mysteries and the sublimities of nature. He will not then go forth to his daily toil like a demented slave, or a senseless automaton, but his eyes by this anointing will be opened to the beauty of God's works spread out before him. The landscape, the velvet lawn, the golden sunset, the gushing fountain, and the little rivulet handing itself

down from crag to crag, gamboling along the hill-sides, and "singing down the narrow glen,"—the hoar frost that puts in bonds the earth, and the snow which covers it like wool,—all are eloquent to the enlightened, but dumb to the stupid. Earth opens her secrets to the inquiring mind,—and the studious farmer, as he bends over his daily labor, reads the deep and hidden mysteries of creation. The winds, the rain, the storms, the tempests, all are to him so many preachers, lifting his reverent mind from the contemplation of nature, up to nature's God.

Gentlemen, I have detained you too long, and, I fear, with too little profit. I have not attempted, for I have not felt competent, to instruct any one of you in the practical details of farming. I have not discoursed of the qualities of manures, of the improvement of your stock, or of the culture of your fruit. These are topics which belong to the practical farmer, and although fully impressed with the importance of all these, and the value of all information respecting them, I am also conscious of my own infirmity. I have sought the rather, on this occasion, to draw your attention to your position and duties, and to the radical defects and short-comings in all our struggles to elevate the standard of agriculture in this Commonwealth. I have also attempted to point out the remedy to be a systematic, a thorough, and a liberal professional education for the farmer, furnished by the State, coöperating with private munificence. And on an institution thus founded and endowed, I have endeavored to ground your hopes for the regeneration of the soil of the Commonwealth, and for the proper elevation and true dignity of her sons.

And permit me, in conclusion, to add, that it lies with yourselves, under a gracious Providence, to say when this golden age shall be ushered in. For though you cannot build this great temple with your own hands, yet you may give tone to the policy of our common government, which can lay its foundations deep as perpetuity, and spread its ample arches broad as the land. You are, in the multitude, as well as in the individual, the architects of your own fortune.

You may, by indifference, suffer the half-finished walls of this temple to tumble down in neglect, or rise, if at all, dispropor-

tioned and incongruous, repulsive to the votaries at its shrine, inefficient in its influence and abortive in its mission,—or you can, if you will, adorn and beautify its rising columns, crowd its broad and lofty portals with devotees bringing their sheaves with them and fixing their trophies in its very dome, till it shall become the just pride, and, under God, the ultimate preserver of the Commonwealth. Build ye, for yourselves and for posterity.

THE PROGRESS OF AGRICULTURE.

From an Address before the Norfolk Society.

BY REV. F. D. HUNTINGTON.

There is a rather irregular and unorganized, but on the whole progressive, body of information, which is called, by courtesy, the Science of Agriculture. It is gradually taking the shape and proportions, under your intelligent authors and periodicals, of other and exacter sciences. If we seize this body of knowledge precisely in its present position, and speak to its present exigency, we shall find, I suspect, that it has passed through its first stage, viz.: its era of general discovery, and is now waiting for the patient hand of detailed experiment, and the organizing effects of a comprehensive induction.

I said it has passed through its first stage, or era of general discovery. The fact is, it passed through that stage so long ago, and stood still so long after, that it might reasonably have been doubted whether it ever meant to go on. If there is any thing amazing in human history, I suppose it is the stationary attitude assumed by this radical employment of man, from the period of its origin in Syria, which must have been somewhere near Adam's time, down to about the present century. Consider that the race of proper ploughs—the only ploughs we should recognize as worthy the name—the basis implement of the whole business—is only about eighty years old. One apology offered for this protracted state of catalepsy is an alleged

double misfortune agriculture has had to suffer from climate—both extremes entering into a conspiracy to put it back; since the tropics ripened every thing for it without the trouble of cultivation, while the frozen regions made it so much trouble to cultivate that it would not try. This explanation would answer pretty well, if nature had not happened to spread out a belt of territory round the globe, which is neither arctic nor torrid, but temperate, of very respectable dimensions, and admirably fitted for any progressive demonstrations, had our enterprising forefathers been so inclined. The simple truth may as well be confessed at once: Our progenitors liked fighting one another better than fighting stumps and swamps. That was the world's boyhood, and, like the few boys left in our day, who are not oldish little men in short clothes, those swift and supple sinews chose the bow and spear, with the big wrestling ground of barbarian tribes, before the civilizing, but rather fatiguing, pickaxe and shovel. A better excuse, I am inclined to think, though far from a sufficient one, will be found in the paradoxical circumstance, that the great advantage of agricultural pursuits has been their great hindrance. I mean the general independence they allow, as providing, in themselves, the necessities of living. This supersedes commerce, removes competition, and so tends to quench enterprise.

In affirming agricultural science to have passed through its epoch of general discovery, however, I referred not so much to the rude and slow advances it made for thousands of years earlier, as to the more recent period when it took a sudden start forward, and may be said to have first risen into the dignity of an intellectual concern. These discoveries moved in two directions, chemical and mechanical. Chemistry applied analysis to the whole material of agriculture, plants and animals and all products, as well as soils; whereas the stupidity of ages had been taking it for granted that, since all earth is earth, it matters nothing what its elements are, so the seed be under ground. Mechanism stretched out its hand, and gave the husbandman a new set of tools—a branch of the general turn for mechanical invention and elaboration that has marked the mental movement of the last hundred years. By both these agencies, not only was a new principle introduced into the action

of agriculture, but at the same time accrued an enlargement of its spirit and motive.

Of course, at the first, chemistry did very little with her crucible, and mechanism comparatively little with its smitheries and factories. Both have, probably, only begun their magical economies yet. But it is none the less true, that in the simple discovery of the fact, chemistry, along with geology and physiology, has relations to farming, and could be made to help it, in the bare establishing of that fact, was a grander crisis in the history of this business than is likely ever to come again. So in the demonstrated feasibility of labor-saving machinery, after the wooden ploughshare and the live-stock threshing apparatus of centuries, there was the turning of a corner, the opening of a new page, the sudden light that always breaks in with the sunrise of a fresh principle, which did more for you than perhaps can be done again. So that if it is modest ever to predicate such a thing of any interest, in a day so pregnant with wonders as ours, we might venture to declare, that the grandeurs of reformation, the cardinal revolutions, and the Lutheran age, in agriculture, are passed.

What, at any rate, is the precise direction of the efforts wanted now, and demanded of you, as farmers, who, in cultivating the earth, mean to cultivate yourselves? It will be found, I suspect, that the answer to this question is as practical a theme, and as well worth your study, as any that the proprieties of to-day could possibly suggest. We hear much vaguely said of the need of enlightened farming—it has been the topic of repeated occasions like this: it is worth inquiring, where, precisely, just at this time, that light should be made to fall in.

In the first place, the posture of New England farmers as they are, exposes the need of rousing still further what may be called the spirit of the profession. It has its own rights, privileges, duties, and titles to homage. I remember, of course, how the very festival that calls us together, the wide departments of your annual display, and especially the spacious and convenient edifice now given up to the uses of your enterprise, with similar gatherings enlivening other counties and States in this part of the year, are proofs that this process of quicken-

ing has already begun, and goes on. But then I remember, as well, how large a numerical majority of those who are called farmers of Norfolk, fail altogether to represent themselves at the fair; how many others are present, not as competitors, *in* the arena, but only as gazers at a brilliant but distant and uninstructive pageant; and how inconsiderable, if I may say so, is the number that carry away such vital impulses, or such solid ideas, as will tell on the direct management of their own acres, and their next year's seed, and crops, and stock. This living and ardent interest which turns every item in the spectacle, every colt and cow, pig and parsnip, heifer and hen, rug and rareripe, to a stimulating value, and nerves a more resolute purpose to make the most of each man's or woman's personal chance,—this is the sort of ambition that pushes your pursuit forward, converting it from a servile drudgery to one of the elegant arts, and winning for it heights of excellence and honor. I am afraid it must be acknowledged that intellectual apathy has been the drowsy curse that has so long somnambulized agriculture; and if it will serve to soften the accusation from an outside party, I will put the pulpit in with the plough; though who knows but if there were less dull planting, the wholesome contagion would run up the pulpit stairs, and there would be less dull preaching? Or, if it seems ungracious to press this charge just when the sleepers are waking up, I remind you, on the other hand, that these occasional signs of animation only cast the adjacent obstinacy into a more palpable disgrace. It is not that cheering signals of of invigorated intelligence are not stirring the air; but that these better notions are not made to work their way out, and settle down on the actual fields, and regenerate your daily operations. Hence, I say, what you want, is, by the help of the school, some systematic means of pushing every improvement out into the mass that have not yet arisen to come in search of it.

If you will allow me to ask questions, Are there no tokens to be found among you, that some of the primary maxims of the improved husbandry are as completely disregarded as the bulletins of the Chinese rebellion? Are there no fields lying in Norfolk, this fall, whose dwarfish crops proclaim as dismally

as language could, that it has not yet been found out by their owners that potatoes and turnips crave potash, that clover and peas want lime, that wheat and oats hunger for silex and phosphoric acid, just as voraciously as the Irishman in the kitchen wants the potatoes, horses the clover, or children late home from school the wheat?

Are there not certain triangular stains smirching the sides of barns under the stable-windows, left there by manure-heaps that took all weathers with no roof, which tell every passer-by that these prodigal feeders, though they locked the barn doors every night, and set traps for foxes, and sent constables after the thief that stole their apples, forgot that the atmosphere has a sly way of turning robber, as well as giver,—that the sun and rain filch as well as fertilize,—and so did not shelter nor fasten down, by boards and muck and forest leaves and plaster, those volatile salts and gases which these noiseless marauders were snatching up into the sky,—so much gold out of their pockets? You would hardly applaud the thrift of a manufacturer that throws away a quarter of his raw material.

Are there no specimens of stock, in the yards and pastures of these towns, rawboned and diseased, and lean as the leanest kine of Pharaoh,—walking illustrations of the "anatomy of melancholy,"—which seem to show that the problem in their keeping has been reduction to the lowest terms, and the multiplying of exceedingly vulgar fractions of beasts, or finding the equation between the minimum of attention and the maximum of emaciation? Is there none of this stock usurping the place, and consuming the fodder, which of right belong to cattle, that should be here in Dedham taking premiums,—stock that has been badly selected, badly crossed, badly reared,—incarnated, or rather inskeletoned libels on the whole law of reproduction?

On the other hand, have you all discovered the real philosophy and economy there is in feeding your cattle on pine boards? in other words, discovered that if you put them *into* a warm stable, instead of letting them shiver on the north side of it, all the drizzly and frosty weather of winter, you thereby provide fuel for their vital sustenance which the furnace in their lungs would otherwise have to borrow from their stomachs, to

keep up the temperature, at the cost of a fifth more in quantity of meal or hay? Have you acted on the false presumption that young cattle will eat up the third-rate stuff, like stalks and straw, with a better appetite if they are not allowed any thing else,—whereas the truth of their dietetics is, that they will swallow this inferior food far more easily at noon, if you lubricate their throats with a little more epicurean catering for breakfast?

Are there no dilapidated buildings, filthy front yards, staggering fences, broken tools scattered over haymows and cornbins and woodpiles, instead of hanging cleansed and polished in a tool-room,—all vile witnesses how it is forgotten that prosperity never takes the arm of a sloven?

Now these neglects seem to show that, over and above the attainments of a few scholarly persons, or rather between their science and the practical work of the multitude, there is needed a connecting link,—something to kindle in Messrs. Smith, Jones and Brown, out on the lots, an appreciative concern for the writings and deductions of Messrs. Liebig and Norton, Hitchcock, Jackson and Harris, in their studies and laboratories. An exhibition is opened to some purpose, if an emulation is provoked by it that sends every man home from cattle-show, determined that he will be a master on his acres, and not a plantation slave, driven by the whip and thong of those two tyrannical overseers, necessity and routine,—an original creator by his mind, and not the mere manual drudge of habit.

ADAPTATION OF SOILS.

From an Address before the Plymouth Society, October 7, 1853.

BY SANFORD HOWARD.

Can the soil of this section be made to aid, advantageously, in the support of your population, and if so, in what manner?

This question leads us to inquire what are the inducements

and facilities for agricultural production here, as compared with other sections? We see, in the first place, that a large proportion of your population is not directly engaged in agriculture. They are consumers of the products raised by others. This not only causes an immediate home market for agricultural products, but creates a demand which cannot be supplied from your own territory, and to meet which, articles are transported great distances. It is obvious, then, that in reference to location, you possess the important advantage of nearness to market —it being even at your doors.

The first view from these circumstances, might lead to the inference that your agricultural advantages were of the highest order. Labor is not more scarce or dear here, compared with other commodities, than in other sections of this country. Why, then, do not the inducements for the pursuit of agriculture preponderate in favor of this section? If there were not other important points affecting the question, it might be answered in the affirmative. In a word, if the natural capacities of your soil were equal to those of some other districts, the superiority of your advantages could not be denied. This is the point in which the comparison is least favorable to you. Some may be disposed to consider your climate as alike unfavorable; a glance, however, will convince one that a large part of the most productive farming land in the country is not more favorably situated in this respect than your section. But in respect to natural fertility of soil, there are large tracts in the interior which are superior to this region. This, then, is the source of a competition in your markets, with which you have to contend unequally. How shall it be avoided? what course can you adopt by which you may place yourselves on an equal footing with those who cultivate a more productive soil?

The first attempt, obviously, should be to confine your operations to those portions of your soil which most nearly approximate to that cultivated by your competitors. If, because they have better land than you, they are able to incur the charges of transportation and oppose you in your own markets, you must meet them with weapons as nearly similar as you can obtain— choose the best land you have, and devote it to those crops which will best reward your labor.

This proposition of course involves a very important modification of the management of land in this section. You have comparatively but a small proportion of that which is naturally fertile, or of that which can easily be kept in a highly productive state. What shall be done with the poorer and greater portion? Devote it to wood. Fuel for your dwellings, as well as for carrying on various manufactures, and timber for many purposes, will always be wanted.

Much of your land which is valueless for cultivation, will produce trees without any labor but that of planting, and in some instances merely by a spontaneous growth. The subject of planting forest trees is one of great moment to many parts of this country, and especially to those sections which have much poor soil. Within a few years it has attracted considerable attention, and encouraging results have been obtained. This is not the proper occasion to go into details on this subject, and there is the less need of doing so from the fact that it has already received your attention. A word as to the kinds of trees best adapted to different situations may not be out of place here.

The white birch will flourish on the poorest soil. Even the most sterile gravel affords it a home in which it grows rapidly. I believe it is the opinion of a distinguished and venerable father of your society, that the poorest land in your section is worth ten or twelve dollars an acre for the growth of this species of tree. In other situations, as the common plain land, the pitch and white pine might be more suitable. The Scotch larch has been found to grow admirably in various parts of this State. It is a tree of great value. It will grow rapidly either on gravelly knolls and plains, or rocky, bleak hills, and makes timber only second in value to oak, and for a variety of uses is even superior. In forty years' growth, in Europe, it answers many purposes in ship-building. On the farm formerly occupied by Col. Timothy Pickering, in Wenham, in this State, is a plantation of Scotch firs, set out by Col. P. about fifty years ago. They are now beautiful trees, and are very valuable for timber.

The young trees may be had at most nurseries, or may be imported, when small, at about two dollars a hundred. The chestnut is easily produced from seed, and in moist, strong soils

grows rapidly, and affords timber of much value. From the habit of sprouting from the stump, and its great tenacity of life, it needs no renewal by planting, after it is once established. The yellow locust, where exempt from the attack of the borer, is highly valuable, and particularly so from its thriftiness on sandy land, and the fertilizing effect it produces on the soil. On this account it has been made very useful in open plantations in increasing the growth of grass.

On blowing sands, and the most bleak and exposed situations, as sea-beaches, &c., the silver poplar will flourish. It grows with more rapidity than almost any other tree, and from its habit of sending up shoots from its roots, which in their turn become trees, it is admirably suited to the locations alluded to.

The proper planting of trees would redeem from unsightly and desolate barrenness thousands of acres, would add greatly to the beauty of the country, and render the land devoted to cultivation more valuable from the protection afforded against winds. In fact, as a means of enhancing the value of landed property by utility and ornament, it is a measure of the greatest consequence.

Having appropriated to trees the land which cannot be profitably cultivated, the next point will be to devote the remainder to those crops which will give the best return. And here it should be borne in mind that we have not only to regard the competition of other sections in the selection of the land, but that point should be kept equally in view in the choice of crops. We must consider what is most needed here, what can be most readily produced, and what is obtained with most difficulty from abroad.

Bulk and weight, rather than the pecuniary value of articles, regulate the cost of transportation. The actual cost of transporting a ton of hay a thousand miles, is as great as that of transporting a ton of wool the same distance, while their actual value bears no proportion.

With you, hay and grass are, and probably will continue to be, the most important articles of farm produce. Domestic animals are essential to supply the wants of a community. Here the horse and the ox are required for labor, and the cow is

required for milk. We see that a large number of these are kept, and hay and grass must be their chief support. The demand for these articles, from causes which have already been mentioned, can be most readily supplied from your own soil. To meet the demand, attention should be directed to the improvement of all grounds calculated to produce good grass in abundance—particularly those which from the presence of water are at present unproductive, but are susceptible of drainage.

Perhaps the next most important article which can be cultivated here, is Indian corn. This strictly American grain is of inestimable value. No other is capable of producing, for the ground it occupies, so large an amount of sustenance for man and beast. It is adapted to a great range of climate—growing from Mexico to Canada. It is not extravagant to say that it has been an important means in the civilization of this country. To our Pilgrim fathers it was indispensable, and in reference to their children, the expression that

"All their bones were made of Indian corn," *

may be said to contain as much truth as poetry. Without it the early settlers could hardly have subsisted. With the grain they fed themselves, and with the stalks they fed their animals. The labors which they accomplished in subduing the forest and their savage foes, furnish proof of its strength-giving properties.

The transportation of Indian corn a great distance, is attended with objections. The cost of freight is as great, per bushel, as that of wheat, and when it reaches the Atlantic cities, its value is only about half as much. This is a sufficient obstacle to railroad transportation. It cannot be brought from the West by any other means, except during the period of lake and canal navigation; and if brought in bulk, (as is done to lessen the expense,) it is, at that time of the year, very liable to injury by heating. It can be brought from the South in vessels, in cool weather. But the comparatively uniform price which the home-grown article has sustained for several years past, is proof that it is not very injuriously affected by foreign supply.

* Barlow.

Proof has been repeatedly given that the light soils of the Old Colony are capable of producing large crops of Indian corn—such as are seldom equalled in other sections; and although the nature of your soil in general will not admit of its cultivation to so great an extent, it is probable that your best crops pay as large a profit by the acre, as any that are produced in the country.

Vegetables and fruits will generally afford you a remunerative profit. They are perishable articles, rather bulky and weighty, and with the exception of such as possess the property of keeping a considerable time, will not bear lengthened transportation; and even in these, there is not yet so large an amount produced in the interior as to seriously affect the market. The apple is used in immense quantities, and may be considered an essential article of food. The pear, though regarded as a luxury, is easily produced, and is readly sold in our markets at high prices. By the modern modes of culture, the tree can be made to bear in a short time from planting, and every person who has a few rods of ground, may enjoy the gratification of eating the choicest kinds.

You have an indigenous fruit which deserves attention. I mean the cranberry. It has latterly been sought after to considerable extent, and actually forms quite an export trade, which will probably increase. In this article you need not fear competition—it cannot be produced elsewhere cheaper than here. There is not a great extent of territory adapted to it. Various experiments have been made to cultivate it on upland, but it seems pretty well proved that it must have an abundant supply of moisture, and that it is not adapted to dry soils. It has succeeded on moist, sandy soils, manured with muck.

Great quantities of vegetables are consumed in an immature state, or are wanted at that time of the year when they cannot be carried far, or kept long on hand. The supply of these is of course within your control.

We have heretofore spoken of the keeping of domestic animals as a matter of necessity; the horse, the ox, and the cow, are to you, incidental requisites. It is worthy of consideration whether the keeping of live stock may not be advantageously

engaged in to a further extent; whether, under the high prices of meat, the production of beef, pork, and mutton, may not be made to pay you a profit. In regard to swine, they are kept to a certain extent, as consumers of articles which would otherwise be wasted. They are also regarded as useful in increasing fertilizing material for the land. But according to some trials which have the appearance of accuracy, a bushel of corn, ground and cooked, or slightly fermented, will make twelve pounds of pork. Something, doubtless, depends on the constitutional propensity of the animals—some being able to assimilate a greater proportion of their food than others. But at the rate mentioned, the pork would pay fairly, at seven cents a pound, for the corn and attendance, and in connection with the advantages before mentioned, might make the business profitable.

The suggestion has been made by an officer of your association, that, by the aid of Indian corn in a green and dry state, and root crops, cattle may be fattened at a profit on some farms in your county. The object is worthy an experiment, which it is to be hoped will be fairly made. In case a trial of this kind should take place, it is desirable that there should be a proper selection of the animals. There is as much difference in cattle as respects aptitude to fatten, as in swine.

But if it should be deemed advisable to engage in grazing here, there is reason to believe that no stock would pay so well as sheep—not particularly for wool, but for mutton. They are specially adapted to light land. They will fatten where no other animal can,—their meat is produced with least cost, and, when it is of proper quality, it commands the highest price. In connection with the growth of turnips, they have been the means of bringing thousands of acres of thin, sandy land in England, from an unproductive state, to one in which it yields fine crops of clover, barley, and wheat. A few trials which have been made in this country, have resulted satisfactorily. It is true we have not the advantage of turnip culture to the extent it is enjoyed in Britain. There the roots are consumed to a great extent on the land where they grow—a mode which is very beneficial. Our winters are too severe for this. Generally, the roots must be gathered and fed under cover. This greatly

increases the expense. Sometimes the weather is such through November that the crop might be fed off. A farmer in Saratoga County, N. Y., has practised this with success. Turnips are sown after a crop of rye or clover. About the middle of October the sheep are put on, confined by hurdles to such lots as they will eat clean, daily. They are kept in this way till frost or snow prevents them from feeding—usually the time is five or six weeks. The sheep, if in tolerable order at commencement, get fat, and the ground gets rich. The cost of the turnips in this case is not over four cents a bushel.

It is a question, to be decided by actual experiment, whether turnip husbandry can be successfully introduced here. I have been told that a late eminent statesman and farmer, whose residence was in your county, made extensive trials with turnips for making beef, and that he found with these roots and salt hay, cattle could be easily and cheaply fattened. I am also informed that an officer of your society has made similar trials with like results.

I am aware that an impression prevails with some persons, that the turnip is a great exhauster of the soil. Some isolated facts in regard to particular soils, or the effect of the turnip in reference to certain crops which follow it, may have given rise to this idea; but in its general application I do not regard it as well founded. It is totally refuted by the great truth that the turnip culture has been the means of vastly increasing the meats and bread-stuffs of Great Britain. This culture has indeed been well termed "the sheet-anchor of British husbandry." Take it away, and the exodus which we have witnessed from Ireland would spread over the sister kingdom, and her

"Bold yeomanry, their country's pride,"

would leave the land forever.

We have now noticed, very briefly, the subjects which bear more directly on the question, whether your soil can be made to aid in the support of your population.

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